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OBSERVATIONS ON THE INTERBREEDING OF *BOA CONSTRICTOR CONSTRICTOR* AND *BOA CONSTRICTOR IMPERATOR*

CHRIS WALLACE¹ and SIMON TOWNSON²

¹36 Woollard Way, Blackmore, Essex, CM4 0QN

²96 The Avenue, Highams Park, London, E4 9RB

INTRODUCTION AND BACKGROUND

The Boa Constrictor (*Boa constrictor*) is a large and generally attractively marked boid which is becoming increasingly popular with amateur herpetologists. This species never really gets too large, as with some *Python* species and the Green Anaconda, rarely exceeding 3 m in length with an average adult size usually in the range of 1.8 - 2.5 m.

Boa Constrictors are impressive-looking, slow moving snakes, generally with a good temperament, which adapt well to captivity. There are currently about 9 different subspecies recognised, with an enormous overall range from Mexico, through Central and South America as far south as Argentina. This is a highly variable snake, with many different colour patterns and other physical differences seen even within a sub-species, and many herpetologists believe the group is in urgent need of taxonomic revision. For example, *Boa constrictor imperator* from Central America tends to be a relatively small, dark, iridescent snake and is quite different to the larger more boldly marked Colombian *imperator*, which is the taxon most commonly seen in captivity. Within the subspecies *Boa constrictor constrictor*, generally known as the 'Red-Tail Boa', there are distinct regional forms seen in Surinam, Guyana and Colombia (Amazonas). This variability combined with the misuse of common names has led to considerable confusion over the identity and origin of some captive boas. For a full description of the *Boa constrictor* subspecies, readers are referred to Peters and Denoso-Barros (1986). A more popular account, with some useful photographs, can be found in De Vosjoli (1990).

In the majority of both private and public collections, in the UK and abroad, the discovery of a formulated and reliable captive husbandry regimen for the breeding of the Boa Constrictor has yet to be made. In particular, a formula for the successful breeding of the so-called 'Red-Tail' subspecies (*constrictor*) remains elusive. This was once the case for several of the now commonly bred snakes, including, for example, the *Python molurus* group. As not all of the parameters for the consistent captive breeding of the Boa Constrictor subspecies have yet been ascertained there remains the need to properly and accurately record and publish any breeding data which becomes available. It is surprising that this extremely attractive and widely kept snake is bred in captivity by relatively few herpetologists.

This account is a record of the recent successful captive breeding of the two subspecies, *Boa constrictor constrictor* and *Boa constrictor imperator* in a private collection, and this is believed to be the first documented record of such a breeding, at least in the UK.

ORIGIN AND DESCRIPTION OF ADULTS

The female *Boa constrictor constrictor* was wild caught in Surinam and was obtained newly imported from a dealer in 1983, when it was estimated to be 3-5 years old. This specimen is exceptionally well marked, even for a 'Surinam Red-Tail', having a very light

fawn background colouration on the dorsal and lateral aspects, contrasting with small crisp, almost black, dorsal saddles which become chestnut coloured blotches towards the caudal region. At the time of the breeding trial the specimen was approximately 2.52 m in length and very heavily built, being a good feeder but of unpredictable temperament. During previous breeding trials it had never been receptive to a male's mating attempts.

The male *Boa constrictor imperator* was a captive bred Colombian specimen obtained in early 1993. This specimen was, reputedly, bred at the Warsaw Zoo in Poland 2 years previously, and was approximately 3 years old at the start of the breeding trial. At this time its length was in the region of 1.83 m. The colouration and markings of this specimen are generally typical of a Colombian Boa, although the background colouration is a little lighter than usual and the dorsal caudal blotches are a particularly attractive deep orange. This specimen had not previously been involved in any breeding trials.

As a suitable and sexually mature male *Boa constrictor constrictor* was not available, the authors decided to collaborate on a breeding project using the two specimens described above. Accordingly, on 7th February 1994 the female was introduced into the vivarium housing the male in a snake-room, which also houses 14 other Common Boas of both subspecies.

VIVARIUM DESIGN, HEATING AND LIGHTING

The melamine vivarium used to house both specimens measured 1.8 x 0.6 x 0.6 m with adequate ventilation panels at each end and a newspaper substrate. Heating was accomplished by taping to the floor at one end a 119 x 28 cm Ultratherm heat mat (that is beneath the newspaper substrate) and connected to a Microclimate DL2 pulse proportional thermostat. Additionally, a well-screened 60 watt tungsten electric light bulb, connected to a mechanical time switch on a 12 h/12 h day/night cycle, was fitted to the ceiling of the vivarium, above the heat mat and towards one end. A standard alcohol thermometer was attached to the back wall - one at each end of the thermal gradient, and a third thermometer was simply laid on the substrate to monitor the surface temperature.

Full and specific details of the type of set-up used, including construction and materials used, were reported previously (see Wallace, 1994). At the time of introduction the daytime air temperature gradient was 27 - 30°C and the substrate surface temperature over the heat mat was 31°C, whilst the night-time air temperature gradient was, during the cooling-off period, 18 - 20°C and the substrate surface temperature over the heat mat was 22°C. This low night-time temperature regimen extended only from 7th February to 13th February (i.e. only one week), although the ambient room temperature of the snake room at this time of year would also have been lower than normal in any event. At the end of the cooling-off period the daytime air temperature gradient was increased to 27 - 32°C and the substrate surface temperature to 35°C over the heat mat, and the night-time air temperature gradient to 24 - 27°C and the substrate surface temperature to 35°C.

COURTSHIP AND BEHAVIOUR

The first mating attempts by the male were witnessed from 17th February and continued for several hours at a time until the end of the following day. The female snake was not obviously receptive or resistant towards the approaches of the male and could be described as generally passive in its behaviour; in addition, the female was not observed to raise its tail or exhibit cloacal gaping, which has been described in this and other species of boid.

The male was subsequently and periodically separated from the female in order to promote further mating behaviour, which was usually regenerated upon reintroduction to the female. The temporary introduction of a second, sexually mature young male did not appear to increase or diminish the original male's interest in the female.

On the 9th March the female sloughed and, predictably, the male recommenced courtship and mating, presumably having been stimulated by pheromones released during the sloughing process.

On 12th April it was believed that the female was gravid, and it was therefore decided to add to the vivarium a 60 watt (30 cm) tubular greenhouse heater (enclosed within a wire mesh box) at one end and at floor level. This boosted the air temperature gradient to 28-35°C followed by a slight reduction in temperature at night. At this stage there was no marked basking response from the female, and intermittent courtship and mating behaviour was still taking place at this time.

By 21st April the female was still not basking, although all mating behaviour had now ceased and a pronounced mid-body swelling was evident.

On 26th May the female sloughed again and as this failed to precipitate any further mating behaviour, the male was transferred to a separate vivarium, in which it fed readily within a couple of days. The female refused all food items offered from the time that mating activity was first observed until after parturition.

By 22nd July the female's mid-body section was very distended and this specimen had established an increasingly regular basking pattern. However, because of the hot summer weather and associated high ambient room temperatures the tubular heater was switched off for much of the time from June onwards. In retrospect we consider that even without the benefit of the tubular heater the female would have been able to closely and accurately regulate the temperature of the developing embryos for most, if not all, of the gestation period. At no time was the frequently reported 'upside-down' basking position of many gravid boas and pythons (Townson, 1980) ever observed.

During August there was some anxiety regarding the female's thermoregulatory behaviour, since it was spending long periods at the cool end of the vivarium where we believed that the temperature (approximately 27°C) was below the optimum for a gravid boa; nevertheless, these fears proved to be unfounded.

PARTURITION AND CARE OF THE YOUNG

During the several days leading up to the day when parturition actually occurred, the female was looking decidedly slim, and there was some concern that the embryos may have been reabsorbed, or alternatively that some other problem had developed. On the evening of 20th September the female voided a small quantity of uric acid (as had occurred on a regular basis throughout the gestation period) and became increasingly restless.

On the morning of 21st September, at 06.45 h, after a gestation period of about 7.5 months about half a dozen new-born boas were seen actively exploring the cool end of the vivarium close to the female. Upon close examination it became obvious that there was another mass of less active and more recently born baby boas within the female's coils, which she appeared to be vigorously defending. As there was some concern that the female might inadvertently crush these babies, the parent was removed (under protest) to another vivarium, where it immediately drank copious amounts of fresh water. This snake remained very aggressive, and appeared to actively seek for the brood for several hours thereafter. Later the following day a defrosted rat was offered and was readily accepted.

When all of the 29 new-born boas had been removed from the vivarium 3 unfertilised ova were discovered. There were no stillborn babies or any individuals exhibiting physical defects. Although quite variable, their overall pattern and colour was more akin to the female than to the male.



Plate 1. Room for housing Boa Constrictor collection, with cages for housing babies in the top left of the picture

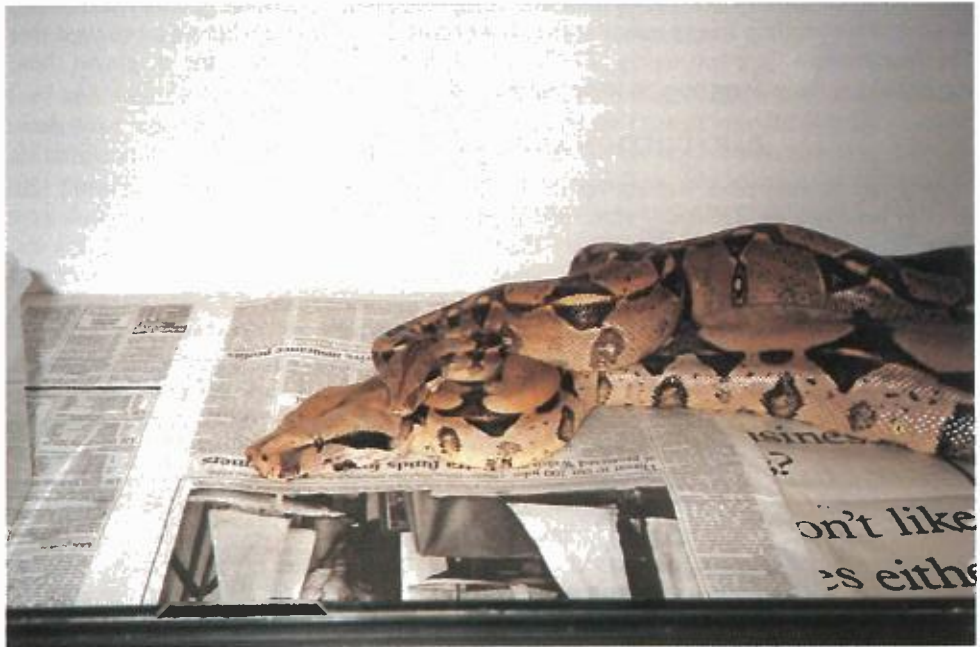


Plate 2. Adult Boas courting on 17th February 1994



Plate 3. Adult female Surinam Boa late in gestation, showing bulge of babies in latter part of body

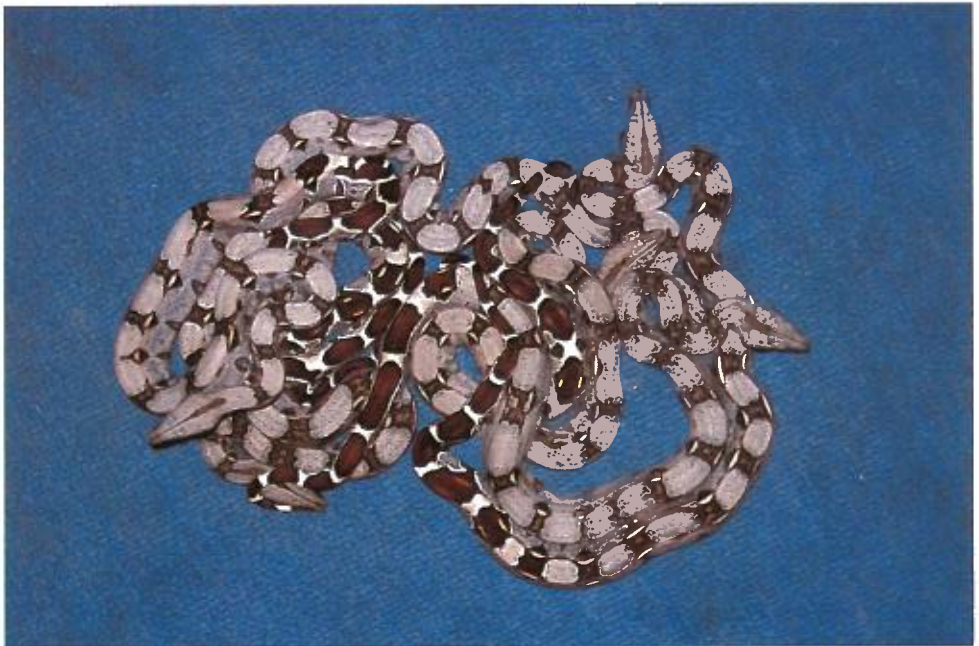


Plate 4. A group of babies shortly after their first slough

As several of the young had relatively large umbilical cords, upon the evening of 21st September it was decided to ligature the cords with thread, after which the cords dried up very rapidly and dropped off within 24 hours. The specimens were then placed in groups of 3 or 4 in separate small flat plastic "Hagen" boxes, with a substrate of moistened white paper towels and with a small water dish. Each box was placed within a large 1.8 x 0.6 x 0.6 m vivarium, so that the heat mat in the larger tank produced a surface temperature gradient of 27-31°C in the smaller boxes from one end to the other. This was achieved by raising the boxes on 1 cm high battens above the floor of the larger vivarium. It appeared to take the neonates 2-3 days to 'learn' how to thermoregulate by shuttling from one end of the "Hagen" box to the other. The paper towel substrate was sprayed 3-4 times daily, until the first slough had been completed and the snakes were less susceptible to dehydration.

The neonates were sexed by probing on 25th September, and this revealed that there were 17 females and 12 males. On 10th October a sample of 14 baby boas (9 female, 5 male) were measured and found to average approximately 58 cm (23 inches) in length, with the average weight for the females at 99.7 g, and 99.4 g for the males. All the babies subsequently fed on half-grown mice and have progressed well.

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