

Pairing behaviour in Australian snakes.

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Introduction;

Aggregation in a number of Australian snake species has been recorded. Aggregation is defined here as three or more snakes being located at a single site, excluding cases where it consists of a single female and newborn young. Species of Australian snakes known to aggregate include;

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|---------------------|--|
| Blind snake | - <i>Typhlina nigrescens</i> (Hoser, 1980; Worrell, 1970) |
| Blind snake | - <i>Typhlina weidii</i> (Hoser, 1980) |
| Carpet python | - <i>Morelia spilota macropsila</i> (Covacevich & Limpus, 1973) |
| Diamond python | - <i>Morelia spilota spilota</i> (Hoser, 1980; Webber, 1978) |
| Arafura File snake | - <i>Achrochordus arafurae</i> (Worrell, 1970) |
| Brown Tree snake | - <i>Boiga irregularis</i> (Covacevich & Limpus, 1973; Gow, 1976; Hoser, 1980) |
| Green Tree snake | - <i>Dendrelaphis punctulatus</i> (Kinghorn, 1969; McPhee, 1979) |
| Yellow-faced | - <i>Demansia psammophis</i> (Covacevich & Limpus, 1972; Gow, 1976; Hoser, 1980) |
| Whip snake | - <i>Furina diadema</i> (Hoser, 1980; McPhee, 1979) |
| Red-naped snake | - <i>Cryptophis nigrescens</i> (Covacevich & Limpus, 1973; Gow, 1976; Hoser, 1980) |
| Small-eyed snake | - <i>Cryptophis nigrescens</i> (Covacevich & Limpus, 1973; Gow, 1976; Hoser, 1980) |
| Swamp snake | - <i>Hemiaspis signata</i> (McPhee, 1979) |
| Red-bellied | - <i>Pseudechis porphyriacus</i> (Hoser, 1989; Kinghorn, 1969) |
| Black snake | |
| Eastern Brown snake | - <i>Pseudonaja textilis</i> (Hoser, 1980) |
| Little Whip snake | - <i>Uroechis flagellum</i> (Fyfe & Booth, 1984) |

The above list of aggregations is by no means complete.

Pairing behaviour is defined here as "when a male and female specimen of the same species are found within close or immediate proximity". This could be under the same piece of ground cover, or within a few metres of each other. Species of snake that engage in pairing behaviour probably also aggregate in large numbers when circumstances allow, and both behavioural patterns must be regarded as essentially similar.

Although it is possible that a pair of snakes may be found adjacent to one another by chance, I believe that such finds are more likely to result from deliberate 'pairing' activity by the snakes concerned. This 'pairing' is presumably linked to mating behaviour.

Some reptile texts, (which I am unable to locate at present), state that for most snake species a male, by his wanderings during the breeding season, will hopefully find a receptive female, mate with her, and then part ways. Observations by myself of wild specimens of many species, and of captive specimens, tend to refute the above idea in at least some species. I propose that for many snake species the male will 'trail' a female for some period during the mating season, possibly mating with her more than once.

Documentation of Pairing cases;

Pairing of snakes is documented in the following species;

Blind snake..... *Typhlina nigrescens*
Spotted python..... *Bothrochilus maculosus*
Ant-hill python..... *Bothrochilus perthensis*
Diamond python..... *Morelia spilota spilota*
Small-eyed snake..... *Cryptophis nigrescens*
Yellow-faced Whip snake... *Demansia psammophis*
De Vis' Banded snake..... *Denisonia devissi*
Red-bellied Black snake... *Pseudechis porphyriacus*
Carpentaria Whip snake... *Unechis boschmai*
Little Whip snake..... *Unechis flagellum*
Hooded snake..... *Unechis monachus*
Black-striped snake..... *Unechis nigrostriatus*

Blind snake, *Typhlina nigrescens*;

Over several years of collecting throughout the Sydney metropolitan area, I have collected over 100 specimens of this species. It was common to find pairs of large adults under a single piece of cover. In May 1975 at Belrose, I lifted a large sleeper of wood and found a pair of this species underneath. The two snakes fled into soil cracks, and only one was caught. The weather was hotter than usual for the time of year, being over 20C. No Blind snakes found by myself were ever sexed.

It is notable that this species can emit a pungent odour when caught, and this may also serve to assist specimens when locating one another.

Spotted python, *Bothrochilus maculosus*;

Smith (1985) revised the snakes formerly called Children's python, *Liasis childreni*, and split the single species into three, of which the Spotted python is one. The Spotted python is found all along the Queensland coast and nearby areas, including northern New South Wales. The Children's python, *Bothrochilus childreni*, is found in tropical northern Australia, except most - if not all - of Cape York, while the Stimson's python, *Bothrochilus stimsoni*, is found throughout most of arid Australia. The name *Liasis* was found to be incorrect, with *Bothrochilus* being the correct genus name.

In August 1974 John Baker was collecting snakes at a property 12 km east of Bingarra, N.S.W. In spite of searching over a wide area for snakes and collecting specimens of several species, he located only two specimens of Spotted python, *B. maculosus*. Both were found in a single rock crevice, (the area had numerous such outcrops). They were adult and of both sexes.

Two further expeditions (average 3 days) by Baker, and two 3 day expeditions by myself to this area, failed to locate further specimens of this species. On two 5 day expeditions to a property near Squaretop Mountain, between Bell and Kaimkillenbun in southeast inland Queensland, Robert Croft caught two pairs of Spotted pythons, *B. maculosus*, in two separate rock outcrops. He caught one pair on each expedition, in May 1974 and May 1975 respectively. Each pair were found sharing a single granite rock crevice.

In the same area, Bill Saunderson also caught an adult pair together under a large slab of granite during the winter of 1974. Like Croft, he caught no other specimens of this species. On a three day trip to the same property in August 1978 I caught another pair in a single rock crevice. I also caught a third Spotted python on my trip. It was a single juvenile, found some 1 km away on a separate hill to where the adult pair were caught. For Croft, Saunderson and myself, all pairs consisted of adults of both sexes.

On 10/8/79 at 5.00 pm, adjacent to 'The Lynd Road', 20 km north of Charter's Towers, Queensland, two adults of this species were caught in adjacent granite rock outcrops by Ron Sayers and myself - one in a 45 cm deep vertical crevice, the other under a large rock that formed a horizontal crevice in an adjacent rock outcrop. Both were adult and of opposite sex. No other specimens were found despite further intensive searching of the area. The female measured 83.5 cm total length, and the male 94.5 cm.

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Ant-hill python, *Bothrochilus perthensis*.

On 5/2/81, Grahame (Dusty) Brown and myself caught two adult Ant-hill pythons inside two adjacent termite mounds some 10 km north of Shay Gap, W.A.. Despite the levelling of all other termite mounds (approx. 6) no other specimens of this species were found, although the possibility of specimens hiding in nearby spinifex clumps could not be excluded. In a period of about ten days collecting around the Port Hedland area at the same time, two further adults were caught. One was a male found crossing the road at night, 1 km north of the Whim Creek Pub, and the other was a male caught emerging from a single burning clump of spinifex about 20 km west of Shay Gap. The male and female caught on 5/2/81, and held by myself in captivity, were observed mating late in 1983 and produced two eggs that November which hatched some two months later. (Eggs laid Nov. 5th a.m. hatching on Jan. 11th a.m., incubated at about 29C.). When caught the adult female measured 62 cm in total length, and the male 54.5 cm.

During a trip to the same area (Goldsworthy/Shay Gap) in January - February of 1984, Charles Acheson and myself caught 8 specimens, including one juvenile, all as a result of demolishing around 30 termite mounds, and a tendency for pairs (of both sexes) to be found in the same or adjacent mounds was also noted.

Diamond python, *Morelia spilota spilota*.

On 8/10/78 John Scanlon caught two adults of this species sunning themselves on top of a rock outcrop which jutted out of the northern end of Donkey Mountain, near Newnes, N.S.W.. The weather at the time was clear, windy and sunny, with an estimated air temperature of 18C. The snakes were believed to be slightly warmer at an estimated 20C, and didn't attempt to flee when caught. The male measured 248 cm total length, and the female 258 cm, both were very large specimens.

No mating activity was noticed in captivity between these two or other specimens of the same species held in a single cage by myself. However, on 30/5/79 two eggs were produced, followed by two more on 6/7/79, and twelve more on 15/7/79. All were apparently hard and infertile, the snake having been 'egg-bound' for some time.

It is probable that the two adults caught by Scanlon had mated shortly prior to capture.

Small-eyed snake, *Cryptophis nigrescens*.

In Darkes Forest, just south of Sydney, N.S.W., this species is very common. In early May 1977 I engaged in substantial collecting activity in the area, and located a single aggregation of 29 specimens of assorted ages (Hoser, 1980). On top of this aggregation many other specimens were also found throughout the district. Most commonly they were found in pairs under a single piece of cover, or immediately adjacent cover, and were adults of each sex.

In an area to the west of Nowra, N.S.W., similar pairing has been noted by myself, (about 10 out of 15 specimens found on a single day hunt - July, 1986), in sandstone hills. In late August 1977 I caught a single pair of these snakes under a large slab of rock in the Moombi Range, N.S.W.. It was snowing at the time.

Pairing of this snake has also been observed in Sydney's north shore, although it seems less common there. The three areas referred to above are substantially colder than Sydney's north shore.

Yellow-faced Whip snake, *Demansia psammophis*.

On a rainy day in August 1975, Alex Dudley and myself caught eight Yellow-faced Whip snakes under scattered slabs of sandstone, near rock outcrops within a few hundred metres of Mona Vale Road, at Terrey Hills, N.S.W. The snakes appeared inactive and the air temperature was about 15C.

All snakes were in pairs consisting of adults of each sex. On the same day a single pair of Small-eyed snakes, *C. nigrescens*, was found. The male and female specimens were found beneath adjacent sheets of tin.

De Vis' Banded snake, *Denisonia devisi*.

In late August 1975, Colin Fitzgerald and myself undertook two full days of collecting adjacent to a swamp between Nevertire and Nyngan, N.S.W.. On the first day the only snakes we caught were a single adult male Eastern Brown snake, *Pseudonaja textilis*, and an adult male De Vis' Banded snake, *D. devisi*, which was caught inside a log.

On the second day, at a different part of the swamp (500 metres from where the other two snakes were found), and adjacent to a pile of human rubbish, two adult *D. devisi* were found under a large piece of wooden sleeper. They were male and female. The weather on both days was cool and sunny with an air temperature below 20C.

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The three De Vis' Banded snakes were retained in captivity, and by December the female was noticeably pregnant. They were passed on to Michael Maddox, where the female apparently gave birth to seven young. No captive mating behaviour was observed between any of the snakes.

Red-bellied Black snake, *Pseudechis porphyriacus*.

Peter Rankin (pers. comm.) documented a case involving an adult female Red-bellied Black snake at a gully in suburban Sydney. The female apparently had a territory that she inhabited and never wandered out of. This snake only utilised a few particular resting places. The snake was observed closely by Rankin for some time. An adult male specimen was seen to enter the territory and later mate with the female. The male 'loitered' around the female for some time (over a week), mating with her more than once, before vacating the territory, never to be seen again.

Carpentaria Whip snake, *Unechis boschmai*.

This species is common around Dalby, Bell and Kaimkillenbun in southeast Queensland. Robert Croft, Bill Saunderson, John Scanlon and myself all note the tendency to find adult pairs of this species together, either under a single piece of cover or nearby to one another. All four of us have made at least two trips (average duration 5 days) to this area for collecting purposes.

When collecting in late August 1978, Scanlon and myself caught a pair of these snakes which we placed in a single bag. Later when inspecting specimens caught that day we were surprised when we pulled one specimen out of the bag to find it copulating with the other specimen.

On a later solo collecting trip to this area, Scanlon had his activities cut short after being bitten by a Brown snake, *Pseudonaja* spp., that he was capturing. He was rushed to hospital after less than five minutes in the field.

Little Whip snake, *Unechis flagellum*.

Pairing of this species has been well documented by Fyfe and Booth, 1984. They reported pairing behaviour in this species, and report it as being more common to find specimens in groups of two or more, than singly. The winter 'aggregations' averaged 3 snakes per rock (presumably including single snake finds in the just quoted statistic), whilst summer aggregations averaged two snakes.

Grant Turner, (pers. comm.), reports that the 'pairs' of these snakes typically consist of both sexes, with larger aggregations often having skewed sex ratios, but still both sexes present. During September 1988 I caught a pair of these snakes consisting of an adult male and an adult female under a single piece of basalt, some 40 km north of Melbourne. Specimens of this and other species of *Unechis* are most commonly found under cover by collectors in the spring months from August to October, but are caught throughout the year. Fyfe and Booth, 1984; Grant Turner, pers. comm.; and myself, have all noted that although found under cover during the day (mostly in cooler months and spring), specimens are often very active when found. Fyfe and Booth, 1984, concluded that mating activity for this species was from April to July, under cover during daylight. Their captive observations supported their conclusions. The results of Turner (1985) indicated a later (October) mating season. (Young are produced 3 to 4 months after mating; Fyfe & Booth, 1984; Turner, 1985.).

Hooded snake, *Unechis monachus*.

During the first week of September 1976, when collecting in rocky hills to the west of Dubbo, N.S.W., Colin Fitzgerald and myself collected 3 adults under rocks in cool, sunny weather with an air temperature ranging between 0 - 20C on a daily basis. A male and female were caught under a large slab of granite, whilst another male was caught about a hundred metres away under another large rock. Intensive searching (roughly 16 hours in two successive days) failed to reveal further specimens of this species.

Black-striped snake, *Unechis nigrostriatus*.

On 11/8/79 Ron Sayers and myself collected along a disused railway line between Charters Towers and Townsville, Queensland. The line consisted of sleepers at close intervals but no rail tracks, so every sleeper could be moved easily. Adjacent small rock outcrops also had large numbers of reptiles. Under a single sleeper we found an adult pair of semi-torpid Black-striped snakes, (it was still relatively early in the morning). In this part of Australia it is only in the cooler months from about May to early September that snakes such as these are commonly found under easily movable cover, as during other months temperatures become too high for the snakes to survive in such places. The male and female caught were the only specimens of this species found, despite some three hours searching in the area.

Discussions and Conclusions;

It is rare for snakes to be found copulating in the wild. However, it is common to find pairs of snake together. Snakes do not need to stay in pairs in order to survive threats from climate or predators, so it must be concluded that pairing is only for breeding purposes.

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Fyfe & Booth (1984) seem to think that for Hooded snakes, *U. flagellum*, pairing is principally for mating purposes. For the two Red-bellied Black snakes, *P. porphyriacus*, referred to by Rankin, the male quite clearly 'trailed' the female for the entire period that he wished to mate with her. Red-bellied Black snakes are diurnal and I have seen no records or had significant experience in relation to this species occurring in pairs, excluding one occasion when I saw a pair mating on a roadway at MacQuerie marshes. The time of day was dusk, and the season was spring. The relatively short period of pairing (little more than a week) for Red-bellied Black snakes is probably why they are rarely found in pairs. A few breeding aggregations of this species are also in the literature.

Trailing of females by males who mate with them on several occasions over 'the mating season' is hard to document in captive specimens, whose close proximity is guaranteed by restricted cage area. However, it is well documented in many species, that males will mate with females on more than one occasion over a given period such as a month. Such is certainly true for Ant-hill pythons, *L. perthensis*, Death Adders, *Acanthophis* spp. (all types), and Diamond/Carpet pythons, *Morelia spilota* spp..

For mating snakes, the male appears to be the one who pursues the female, therefore pairing is assumed largely to result from the initiatives of the males. How aggregations consisting of large numbers of snakes form, including large numbers of females, is also an area that needs further investigation, as that may imply a greater than predicted female role in pairing behaviour.

Further investigation of pairing behaviour in snakes will probably reveal a greater than expected number of species that have males who trail females for lengthy periods. That is periods in excess of one month.

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References cited;

- Covecevich, J. & Limpus, C. 1972. 'Observations on community egg-laying in the Yellow-faced Whip snake, *Demansia psammophis*. (Schlegel) 1837. (Squamata; Elapidae). *Herpetologica*, 28 (3) pp 208-210.
- Covecevich, J. & Limpus, C. 1973. 'Two large winter aggregations of three species of tree-climbing snakes in South Eastern Queensland'. *Herpetofauna* 6 (2), pp 16-21.
- Fyfe, G. & Booth, P. 1984. 'Some notes on the habits of the Little Whip snake, *Unechis flagellum*'. *Herpetofauna* 6 (2), pp 16-21.
- Gow, G.F. 1976. 'Snakes of Australia'. Angus & Robertson, Sydney, Australia.
- Hoser, R. 1980. 'Further records of aggregations of various species of Australian snake'. *Herpetofauna*, 12 (1), pp 16-22.
- Hoser, R. 1989. 'Australian Reptiles and Frogs'. Pierson & Co, Sydney, Australia.
- Kinghorn, J. 1969. 'The Snakes of Australia'. Angus & Robertson, Sydney, Australia.
- McPhee, D. 1979. 'The Observers Book of Snakes and Lizards of Australia'. Methuen, Sydney, Australia.
- Smith, L.A. 1989. 'A revision of the *Liasis childreni* species group, (Serpentes; Boidae)'. *Records of the West Australian Museum*, 12 (3), pp 257 - 276.
- Turner, G. 1985. 'Captive breeding of *Unechis flagellum*'. *Herpetofauna* 16 (2), pp 53-54.
- Webber, P. 1978. 'A note on an aggregation of Diamond pythons, *Morelia s. spilotes*, in the Grosse Valley, N.S.W.'. *Herpetofauna* 10 (1), pp 25-26.
- Worrell, E. 1970. 'Reptiles of Australia'. Angus & Robertson, Sydney, Australia.

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Plate 1; Yellow-faced Whip snakes, *Demansia psammophis*. These snakes were caught as a pair under a rock, at West Head, N.S.W. (see Hoser - pp 84 - 92) Photo by author.



Plate 2; Mangrove snake, *Boiga dendrophila*. (see Tweedale, pp 95 - 97) Photo by P.J.Siviter (1982) courtesy of K.J.Hingley.