



EXPERIENCES WITH A FEMALE ACANTHOPHIS ANTARCTICUS.

Rob Valentic

■ INTRODUCTION

On the 19th January 1995 a sub-adult female *Acanthophis antarcticus* was collected from mallee habitat west of the Middleback Ranges in South Australia (33 °11'S X 137 °02'E). A take permit was kindly issued by the Department of Environment and Natural Resources in order to begin a breeding program which would allow accurate data to be compiled on genetically compatible Death Adders obtained from one specific locality. The following note details the initial capture of the *Acanthophis antarcticus* above with additional reptile species observed during the search and subsequent captive notes until the unfortunate death of the adder on the 11th February 1997.

■ THE SEARCH

The most successful method employed by collectors in order to locate *Acanthophis* spp. is to drive slowly along roads intersecting suitable habitat on nights that offer the "right" conditions for activity. Nights with no moon present are

favoured by most collectors but in my experience are not necessary for success. The populations of *Acanthophis antarcticus* in the Middleback region are active at air temperatures as low as 17 °C irrespective of lunar cycles and one's chances of an encounter depend more on air pressure levels (personal observations). Every *Acanthophis antarcticus* that I have found active in the Middleback area has been located between 21.15 and 23.55 hrs. The majority of these sightings have occurred between 22.00 - 22.30hrs (Central Standard Time with Daylight Savings in effect). For example I tend to feel confident of success if a warm to hot day is preceded by a cold front in the form of dark clouds building in the afternoon, although I have gone out on marginal nights with relatively stable air pressure feeling totally pessimistic and still managed an adder.

The top temperature for Whyalla on the 19th January 1995 was 34 °C and conditions were fine and sunny with a constant sea breeze (all temperatures and relative humidity measurements taken using a whirling psychrometer). During

the early afternoon cumulus cloud formations began to build to the east and west of the township, although the front did not reach the area until 22.00 hrs (Central Standard Time). Michael Kearney and I entered the start of appropriate habitat (roughly 500 metres west of Sinclairs Gap on the dirt road to Kimba) at 21.07 hrs. Measurements were taken at this time of the weather conditions. Air Temperature (AT): 24 °C, Relative Humidity (RH): 68%. It was quite windy with a clear sky and no moon present at that time.

The first reptile encountered as we continued to drive westwards was an adult *Triodia* Earless Skink (*Hemiergis millewae*) (Common names follow Ehmann, 1992) crossing the track at 21.17 hrs. At 21.19 hrs an adult Tree Dtella (*Gehyra ariegata*) with a regenerated tail was sighted along with another *Gehyra variegata* at 21.30 hrs which also had a regenerated tail. Both lizards were in the process of crossing the track. A sub-adult Marble-faced Delma (*Delma australis*) performed multiple leaps upon disturbance from our headlights as it crossed the track at 21.37hrs. (AT: 21.5 °C, RH: 78%, very windy). At 21.55 hrs an adult Wheat-belt Stone Gecko (*Diplodactylus granariensis*) was discovered active on the track (AT: 21 °C, RH. 84%). The immediate habitat consisted of a sandplain vegetated with a mixture of myall and mallee plant communities. This species is one of the least commonly found geckos in the mallee

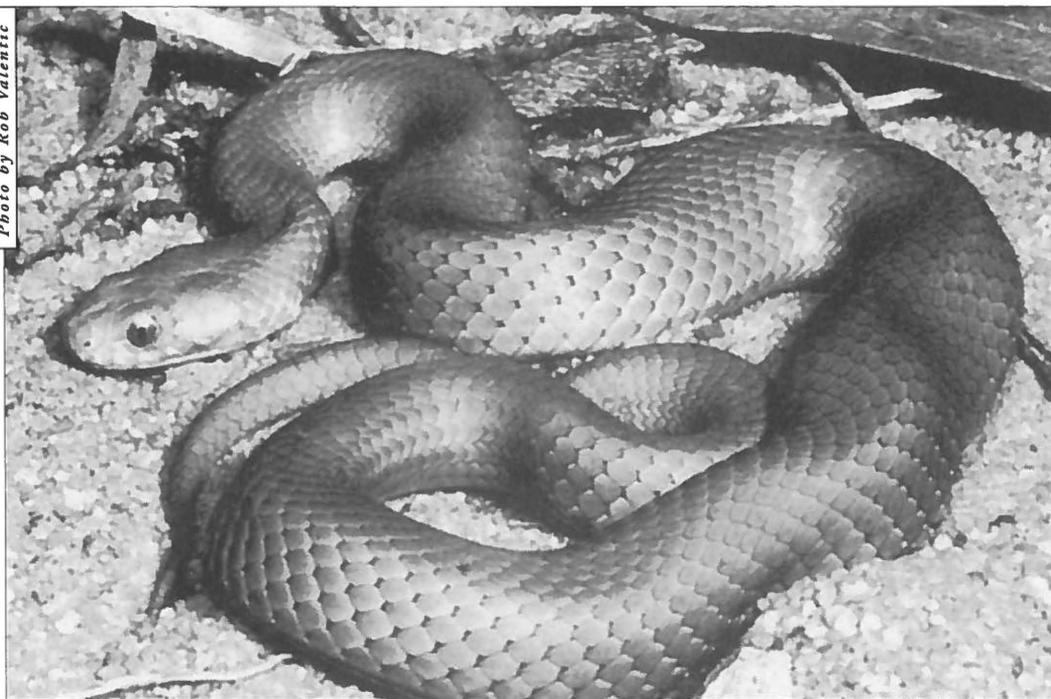
habitat here but is commonly encountered in chenopod shrubland on compacting soil habitats closer to Whyalla (Valentic and Kearney, personal observations).

At 22.00hrs, with a full moon rising on the horizon an adult Beaded Gecko (*Lucasium damaeum*) with an original tail was seen crossing the track (another 2 adult *Lucasium damaeum* sighted at 21.50 and 22.20 hrs). At 22.50 hrs a juvenile Bardick (*Echiopsis curta*) was found active on the edge of the track on a slope vegetated with mallee and a dense Hummock Grass (*Trodia irritans*) understory (AT: 19.8 °C, RH: 80%, wind persisting). In the space of 8 minutes at 22.58 hrs another *Echiopsis curta* was found on the track measuring around 300mm in total length.

At 23.55hrs the *Acanthopis antarcticus* was captured. The immediate habitat had been burned about 5 years prior and was not fully regenerated. Mallee eucalypts were blackened extensively on the trunks and new shoots were forming on the tree crowns. Ground litter was sparse and the essentially bare understory consisted mainly of chenopods.

Upon capture the wind was easing and cloud cover was building. (AT: 20 °C, RH: 92%). The adder was found fully stretched in the middle of the track one km west of the first cattle grid west of

Photo by Rob Valentic



The lighter coloured adult male Bardick *Echiopsis curta* found 19/01/195 near the Middelback Ranges.

Sinclair's Gap. The adder measured about 350mm in total length and she was weighed at 75 grams back at Peter Mirtschin's facilities several days later. At 0.25 hrs another adult *Echiopsis curta* was found on a slope vegetated with *Acacia*'s and *Trodia irritans* understory as it crossed the track.

The two adult *Echiopsis curta* differed markedly in dorsal colour, one chocolate brown and the other a pale yellowish brown. The finding of three *Echiopsis curta* in one night in the region is significant as the species is not regarded as common

here (Ehmann, 1992). Therefore, the above weather conditions may be interpreted as optimal for activity in the species. I have never encountered *Echiopsis curta* in the area since that night despite having surveyed the area regularly and the searches coinciding with similar times and conditions.

On the return drive towards Whyalla two adult *Lucasium damacum* were seen active on the Kimba track and two adult Burrowing Frogs (*Neobatrachus pictus-centralis complex*) were observed stationary on the Lincoln Highway in cheno-



The immediate capture site of the *Acanthophis antarcticus*. Note that the ground litter is essentially bare and the understory vegetation sparse due to a previous fire.

pod shrubland closer to the outskirts of Whyalla. One adult DOR (Dead On Road) Broad-banded Sand-swimmer (*Eremiascincus richardsonii*) and four adult Southern Spiny-tailed Geckos (*Diplodactylus intermedius*) lying motionless and prostrate to the bitumen in an apparent attempt to bolster body temperature levels were also noted in the area.

■ CAPTIVE NOTES

The adder was housed in a thermostatically controlled marine-ply enclosure

with a 6mm glass front with a newspaper substrate. A water bowl was provided along with a Hummock Grass clump for a little added security during the initial settling period.

The enclosure is heated with a 40 watt incandescent light bulb by day and a second 25 watt blue bulb is switched on during the evening in order to provide a natural cooling period at night and allow for the ease of observations during activity periods. The heat sources are placed at one end of the cage providing a ther-

Photo by Rob Valentic



The *Acanthophis antarcticus* the day after capture.

mal gradient and the thermostat is mounted at the cool end of the cage at ground level to ensure an adequate temperature range for terrestrial species. Winter cooling periods were provided with ground temperatures as low as 16 °C maintained at the cool end of the enclosure for a three month period. Increases or decreases in temperature were always gradual. Cage dimensions as follows: 500 mm long, 600mm high and 320mm wide. Note that a top opening enclosure with added height is preferable for swift striking venomous species

like adders due to the additional safety afforded.

The adder settled in well and readily accepted mice within a few days. No problems were experienced for the first twelve months and then all of a sudden the adder began to regurgitate most meals. Wheezing spasms in conjunction with a distinct mid-body bulge was often noted prior to regurgitation with the food item typically expelled around 48 hours after consumption. My initial concern was a parasitic infestation so a

'shotgun' therapy consisting of Droncit, Flagyl and Panacur was administered using dosages recommended by Klingenberg (1993). After the therapy no improvement was noted and a conversation with Bruce Munday led to the suggestion that the adder might be suffering from a concentration of Lungworms (*Rhabdias* spp.). The larvae of these parasites may reach high concentrations in the lung leading to a verminous pneumonia, characterized by a gaping mouth, wheezing and exudate from the trachea (Klingenberg, 1993). It was noted that the adder tended to hold down smaller feeds such as small mice or pink rats more consistently than larger feeds so supportive drugs were injected into these food items. The 'shotgun' treatment was carried out once a week for three weeks during late January to early February 1996. Note that while ill the adder rarely refused food offered and continued to increase in size and weight despite regular regurgitation. During March 1996 3 doses of Panacur were administered once per week for three weeks via a ball tipped dosing syringe to control any potential *Rhabdias* infestation. The dosage rate was increased to 50mg per kg (Klingenberg, 1993).

Upon the introduction of a male Middleback *Acanthophis antarcticus* on the 28-31 March 1996 the female became nervous and agitated when any physical contact with the male occurred. The male was interested in copulating but any

contact initiated by him resulted in the female flailing her tail wildly and swiftly moving away. She would then rest with her tail concealed beneath her head in an effective attempt to hide the cloaca. The male tried unsuccessfully during the period to copulate but seemed to lose interest after several chases around the enclosure. Perhaps the female sensed her illness and as a consequence felt that reproduction was a risky undertaking.

The regurgitation accompanied with wheezing persisted despite the therapy and during late June 1996 the wheezing spasms intensified, I assumed this to be associated with the cooling period. The ground temperature at the warm end of the enclosure was increased to 30 °C throughout the winter period and the water bowl was removed permanently in order to prevent high levels of humidity which could cause the suspected bacteria spores to flourish. The adder was sprayed with a spray nozzle daily and readily adapted to drinking from the droplets of water that accumulated on the scales.

A conversation with Dr. Jim Greenwood led to the suspicion of a chronic respiratory condition so I began to dose the adder with antibiotics. Baytril was administered via the intramuscular route once every third day at 0.5ml up to mid-August 1996. Although the wheezing subsided during these courses the Baytril failed to completely suppress the symp-

toms. On phoning Dr. Greenwood I was told that a possible immunity to Baytril by the suspected bacterial strain may have occurred. Another antibiotic (Pipril) was purchased and after four intramuscular injections dosed at 0.5ml were given up to early September 1996 the wheezing had ceased and the adder was holding all food taken.

On the 8th September 1996 the wheezing returned at irregular intervals. Regurgitation had completely subsided and I decided to administer another course of Pipril at 0.5ml injected into food items offered. This was mainly due to the risk involved in handling the adder and giving injections that further stressed the snake. Note also that the adder was one of the nastiest snakes I have ever kept although I have no doubt that the temperament related to the illness. Feed dosed with Pipril was taken on the following dates; 08/09, 10/09, 12/09, 17/09 and 03/10/96. The treatment failed to reverse the wheezing and the condition steadily worsened.

On the 5th November 1996 she ate two mice and subsequently regurgitated the last one eaten within thirty minutes of consumption. The wheezing condition was also accompanied by sporadic gaping and to say I was slightly frustrated would be a gross understatement. At 11.15am the next morning the other mouse was also expelled so on the 13th November 1996 I presented the adder

to Dr. Brendan Carmel in order to consider any options. A lung flush involving a narrow catheter inserted down the trachea and into the lung was performed with the solution extracted and lab tested for analysis. Dr. Carmel advised me to switch back to Baytril and to inject dosages intramuscularly, suggesting that the suspected bacteria may require constant attention to be effectively countered. Saline solution was also to be injected into the adder every 72 hours in order to rehydrate the animal due to the substantial dosages of antibiotics given.

The lab results tested negative for bacteria or the presence of *Rhabdias* ova or larvae one week later although these tests are not always conclusive and may have to be repeated more than twice to show positive results. The course recommended by Dr. Carmel was followed strictly with no improvement noted other than the cessation of regurgitation. The wheezing and gaping gradually worsened over the ensuing months despite a concerted effort to reverse it. It was noted that the heaviest respiratory attacks were always post prandial. On the evening of the 10th February 1997 a salival discharge was found in her enclosure with blood specks present within the saliva. The wheezing intensified that night and the following morning the adder was observed thrashing around the enclosure with her mouth constantly agape and the glottis fully extended. Her head was per-

sistently raised above the substrate and the wheezing was uninterrupted. She passed away at 11.30am and her death appeared consistent with suffocation. I mourned her passing all day and it hurts to write this note months later. She was a magnificent specimen and I felt powerless to cure her.

On the morning of the 13th February 1997 I presented the adder to Dr. Greenwood for necropsy. Upon dissection the cause of death was obvious and differed markedly to the result that I anticipated. An individual spine from the Hummock

Grass that was initially placed in the enclosure had travelled down the trachea and over time had developed four distinct puss filled abscesses that had grown in size and completely blocked air flow to the lungs.

Two possible scenarios apply as to how the spine actually ended up entering the glottis, noting that the pointed end of the spine entered first:

1. The spine adhered to a food item and on swallowing the prey the spine infiltrated the glottis.

Showing the position of the Triodia spine lodged in the right lung after necropsy.

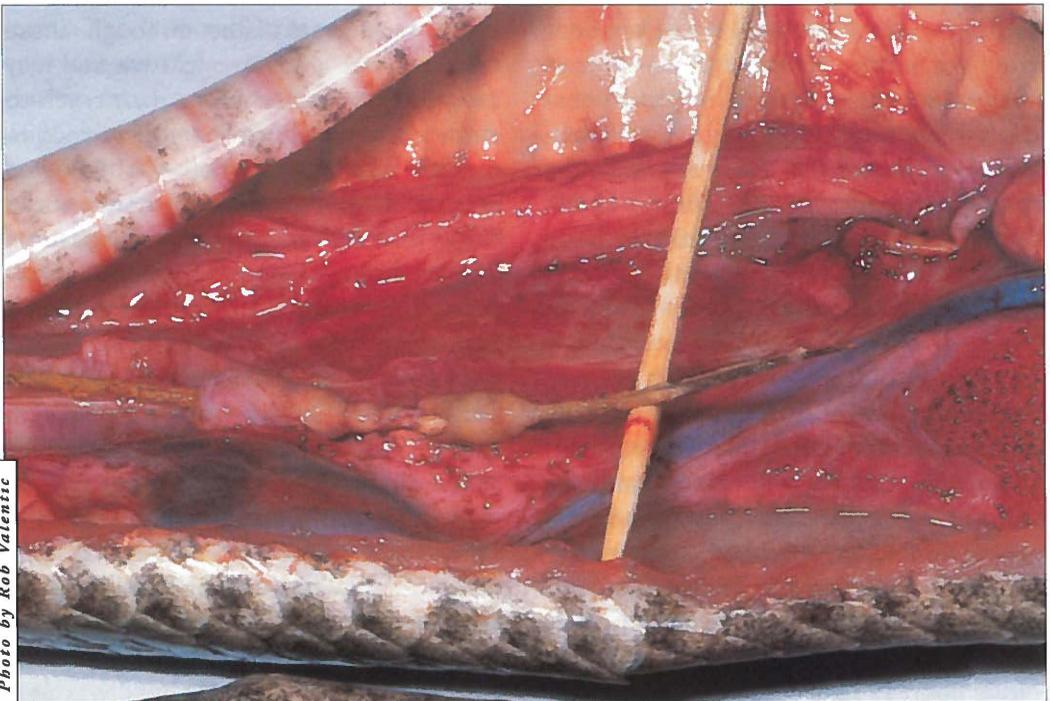


Photo by Rob Valensic

- The snake struck at prey located within or adjacent to the Hummock Grass clump and missed, striking into the clump and effectively spearing the spine into the glottis.

The spine tip and most of the stem was well embedded into the right saccular lung and the distance to the base of the spine within the trachea to the glottis was 147mm. The length of the entire spine was 63 mm, with the pointed tip well defined and sharp to the touch. Most of the posterior end of the spine was completely encased in the trachea

and the spine had not perforated the trachea along its entire length. The four abscesses had completely enveloped the stem and the two largest ones measured 11 mm long x 6 mm wide and 8 mm long x 4 mm wide. The width of the trachea was uniform and measured 5mm.

The adder was in excellent condition internally despite this, with plenty of fat deposits present, ovaries in the process of reabsorption and next seasons ova present. No evidence of parasitic infestation was visually noted.

Close up of abscesses that formed on the stem.

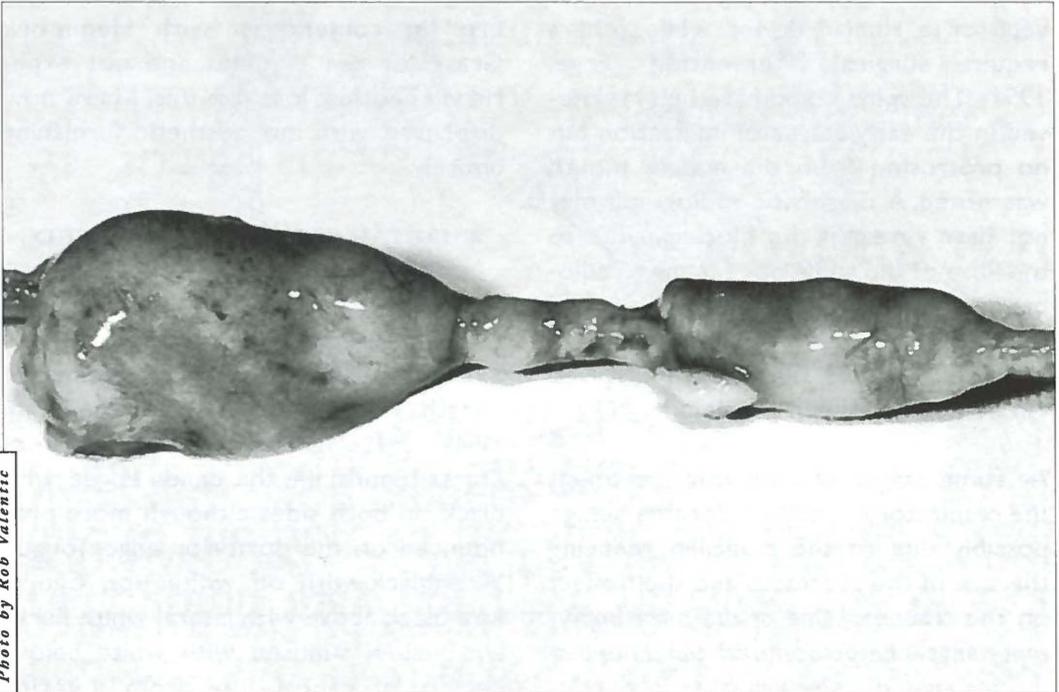


Photo by Rob Valentic

It is likely that the foreign body travelled down to this position gradually and was aided by snake movement such as peristalsis. Back at the time the lung wash was performed the catheter may have either pushed the spine further down the trachea or squeezed through a narrow gap between the trachea and the spine. Perhaps the cartilaginous ribs that strengthen the trachea may have impeded the spines progress over time, The spine definitely originated from the clump present in the enclosure as it is a thicker stemmed species of *Triodia* compared to *Triodia* spp. from the Middleback Ranges area. Often foreign bodies are retrievable through an endoscope with a pair of long handled forceps or a similar device while others require surgical intervention (Frye, 1991). The spine could have been retrieved in the early stages of infiltration but no protrusion from the adders mouth was noted. A diagnostic radiograph may not have revealed the blockage due to the fibre of the spine not casting a radioopaque shadow. In any case, the surgical removal of the object in light of the delicacy and size of the viscera involved would not have been possible.

At some stages of antibiotic treatment the respiratory condition became benign possibly due to the penicillin reducing the size of the abscesses and their effect on the trachea. "*One of the most important things a herpetoculturist can do to better manage a collection is to obtain as*

much information as possible from any herp that dies. The loss of an animal is always discouraging, but it may provide an opportunity to gain valuable insight on husbandry practices and diseases. Ultimately, this may help prevent future losses within the collection" (Stahl, 1996). The importance of a necropsy examination is highlighted in this case. The diagnostic assumptions made were proven incorrect by the examination and I learned that the adder died from unusual circumstances. The peace of mind of knowing that the adder was disease free and for the welfare of the other snakes in the collection was worth the effort. Mortalities such as this are rare and although I could maintain adders in enclosures in conjunction with Hummock Grass for ten lifetimes and not experience another loss like this, I have now dispensed with any aesthetic furnishing entirely.

■ DETAILS OF THE DECEASED

ACANTHOPHIS ANTARCTICUS

The following details were recorded before dispensing with the carcass:

SVL (Snout-Vent Length): 652.2mm. Tail Length: 114mm. Total Length: 766.2mm. Weight: 416 grams. Total Number of Dorsal Bands: 44, the bands edged with black on both sides although more pronounced on the posterior edge. Tongue base black with off white tips. Caudal lure black above with lateral white flecks and yellow suffused with white below. Length of caudal lure from anterior

colour change to the spine tip: 30.2mm. Head Width at the widest point: 30.1 mm. Head Length from the snout tip to the posterior edge of the parietals: 22mm. Mid Body Rows: 21. Ventrals: 123. Anal: Single. Subcaudals: 24 single followed by 16 divided and single for 77mm from the posterior edge of the anal scale.

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