

## FLU IN BOBTAIL SKINKS (SHINGLEBACKS)

### History

Since 1996 shingleback lizards (called bobtails in Western Australia) have been admitted to Kanyana's wildlife hospital with an unknown upper respiratory tract infection (URTI) - the Bobtail Flu.

From 2002, the number of affected lizards from all over the Perth metro area- Mandurah to Joondalup, hills to coastal plains, increased dramatically. This disease is very contagious to other bobtails and appears to be airborne. Some locations were hot spots with many lizards affected.

Wildlife carers formed a consultation group with the Department of Conservation and Land Management (DCLM) in 2000, to share information and alert other carers to disease outbreaks. Wildlife officer, Peter Lambert, located a pathology report (Dept. of Agriculture- Animal Health Laboratories) for a bobtail, dated 23 October 2000. The symptoms were similar and the findings were "possible viral upper respiratory tract infection".

The summer of 2000 and 2001 was unusual in that many flu-affected bobtails were admitted to Kanyana. Previously these cases were more common in the colder winter months.

In July 2001 Dr. Cree Monaghan (head Veterinarian at Perth Zoo), examined several bodies at post mortem, and sent samples of tissues for pathological examination. Her comment was that a causative agent could not be readily identified which might suggest that the disease could be caused by a virus. Unfortunately, there were not enough resources to go any further. Volunteers at Kanyana continued to explore other avenues to identify the causative agent of the disease and find a cure.

An article on green blood in bobtails, in the Summer 2001 edition of Wildlife Australia Magazine, written by Dr. Marcello Pennacchio of Curtin University. He visited Kanyana in August 2002 and took blood and oral swabs from affected lizards and sent them to Melbourne for virological examination and classification. Marcello also took frozen bodies and a live, moribund animal back to his laboratory. His findings have led to him to believe that the virus he has been studying, produces similar signs to those found in flu-affected bobtails at Kanyana and other wildlife facilities around Perth.

The total number of bobtails admitted to Kanyana in 2001 was 95 of which 40% had the flu. By 2002 this figure rose to 152, which is over 50% more bobtails and half of these had the flu. By 2003 the admissions dropped to 122 and the number of bobtails seen out and about or even

road killed bodies, was the lowest in living memory. Some carers have not seen bobtails at all compared to normally high numbers in the past.

YEAR	TOTAL NUMBER OF BOBTAILS ADMITTED	NUMBER OF LIZARDS WITH FLU	NUMBER OF FLU CASES RELEASED AFTER TREATMENT
1998	78	22	14 (64%)
1999	75	21	16 (76%)
2000	88	24	14 (58%)
2001	95	39	25 (64%)
2002	152	74	62 (85%)
2003	122	52	45 (86%)

Flu affected Bobtails admitted to Kanyana

Media releases, educational talks and newsletters from Kanyana and Zanthorrea Nursery, as well as networking through the Wildlife Carers' Consultation group have raised public awareness of the "bobtail flu". It was thought that the increase in the number of bobtails admitted to care was due to this new awareness however as the numbers dropped in 2003, that doesn't seem to be true.

The general public are quite concerned about the plight of the bobtail and consequently we now see more cases that are in the early stages and these respond more favourably to treatment - 86% of URTI bobtails recovered and were released in 2003. End stage cases are euthanased on humane grounds as they fail to respond to treatment and eventually die by suffocation.

Legislation passed in 2003 allowed people in WA to own native reptiles including the bobtail. Now this disease not only affects wildlife but the pet trade and veterinary care of pet reptiles in WA as well as interstate when lizards are bought and sold to enthusiasts around the country.

Already, a person in Queensland has reported that a bobtail purchased from WA, became ill with flu symptoms.

The Lotterywest Bobtail Conservation Grant of \$64,000 was awarded to Kanyana in January 2004 for

- Kanyana to purchase improved housing and equipment to cope with the large numbers of URTI bobtails admitted.
- Curtin University to carry out an ecological study on the bobtail to determine the impact of the disease on the bobtail and western bluetongue lizard populations.

- Pathology to investigate the aetiology of the disease, carried out by Murdoch University, to shed light on how to best treat the animals.

Blood samples were taken from the tail vein of hospitalised bobtails at Kanyana by Murdoch researchers in March and May 2004.

There have been 95 bobtail admissions in the first 6 months of 2004, 21 of these were born at Kanyana to sick mothers; 10 stillborn and 11 live and healthy. Two mothers died while giving birth and caesarean sections were performed. One had quads (very rare in bobtails) that were unable to be revived and the other had triplets of which two were revived and have been soft-released and remain in good health. The high mortality of newborns could adversely affect the recovery of this species.

There appears to be a significant and concerning problem in the bobtail population.

### Signs of the Disease

May include all or some of the following:

- Emaciated, with a thin, flat tail
- Bones prominent at pelvis and along spine
- Lethargic and non responsive
- Sticky clear ocular and nasal discharge, sometimes bubbly, eyes often glued shut
- Sneezing a lot (healthy bobtails will occasionally sneeze to clear salt deposits formed in the back of the throat)
- Pale pink to white mucous membranes in throat (tongue is normally blue)
- Thick, tenacious mucous in throat
- Younger bobtails may show lower respiratory disease, bloated torso, gasping for breath

Post Mortem findings

- Poor body condition with fat pads depleted
- Thick mucous in throat which may form a plug in the opening of the glottis
- Lungs are inflamed and can extend to full length of body cavity i.e. twice the normal length
- Lungs remain inflated
- Liver changes evident in advanced cases - pale

### Medical Treatment (under veterinary supervision)

- Treat trauma cases in the hospital first, then attend to infectious cases in an isolated area.

- Use barrier nursing- **wash hands after handling each animal.**
- Gradually warm the animal to preferred Body Temperature (30° C)
- Re-hydrate orally with warmed Normal Saline (2-5ml/100gm of body weight) spread over the first day

Lizards need 1-2% of their body weight in water daily for maintenance, 5% if dehydrated. Most rescued lizards are dehydrated.

- Nebulise x 1 daily (see below)
- Inject **Baytril 50®** Intra-Muscular (I/M) in the upper body area, at 0.01ml/100g body weight, every 48 hours until gut function returns through feeding and passing stools.
- Change to **Baytril 25®** Per Oral (P.O.) at 0.02ml/100g body weight, 2<sup>nd</sup> daily until a total of 14 treatments (I/M + P.O.)
- Cease Baytril but continue to nebulise for 1 week
- Cease Nebuliser and observe for signs of relapse for 1 week

The length of treatment is a **minimum of 6 weeks**. Relapses were common in the past when medication was given for 5 to 10 days.

More information is needed to understand the effects of medication on the unborn of pregnant females in care and if any adjustments to dose rates are needed, based on the mother's quiescent weight. Bobtails have placentas but it is not known if the disease or medication can cross into the embryo. Newborns eat their yolk sac and placental membranes and are then separated from their sick mothers to prevent infection. The high number of stillbirths is cause for concern.

### Nebuliser

- Place 1.0ml distilled water for each cylindrical chamber in use, into the nebuliser bowl (0.5ml/chamber for the white nebuliser)
- Place the top of the bowl into the central fitting of the chamber unit
- Turn unused chamber knobs to off position
- Place bobtail into chamber with its head at the opposite end to the nebulise and turn on pump unit
- Turn off pump when nebuliser bowl is empty, 10 - 15 minutes for 4 chambers
- After removing bobtail, spray inside of chamber with *Trigene®* disinfectant and wipe dry

Cases diagnosed early may not require antibiotics. Nebulisation and good nursing care may be adequate enough to allow the animal's immune response to fight the infection. This needs to be determined in a clinical study.

### Husbandry

The vivariums are lined with 3 sheets of newspaper, which is changed daily. Three times a week the inside is sprayed with *Trigene*® disinfectant and wiped dry. Water and food dishes are soaked daily in the same disinfectant then put through the dishwasher set for hot water.

### Daily Supportive care

- Record weight
- Bathe eyes with warm water to remove sticky exudate
- Apply ophthalmic ointment when prescribed
- Wipe mucous from inside mouth/throat with a cotton bud
- Remove ticks
- Clean and dress any wounds
- Take to vet for major wounds/ fractures
- Check faeces for internal parasites and treat accordingly
- House in vivarium, providing a heat gradient with a basking lamp and under-floor heat pad. Preferred Body Temperature (PBT) is 30° C. (monitor temperature of each vivarium)
- Provide normal photoperiods using UVA/UVB daylight tubes, which are set with a timer to turn off at night and on in the morning.
- Tube feed Reptile Supplement in Normal Saline (2ml/100g body weight) if debilitated. When passing faeces change to-
- Assist feed daily until self-feeding enough to gain/maintain weight (see *sick bobtail diet* below).
- Move to Pre-release box if available, when medical treatment and observation period cease
- Change to *healthy bobtail diet* (see below) until pelvic bones and spine are well covered and tail is plump.

### Diet for re-hydrated sick bobtails

(Food size appropriate for size of the lizard's throat)

- Meatballs\* sprinkled with reptile supplement,
- Soft fruit - watermelon, grapes, banana, strawberries, peaches
- Green vegetables - milk thistle, broccoli, watercress, endive, *minimal* spinach (they love native yellow flowers)
- Occasional chopped hard-boiled egg or raw egg yolk. Hand feed raw egg yolk as bobtails will walk through a shallow dish and become coated in egg yolk.

- Dropper *Reptavite*® vitamin supplement onto skin (1 drop/50g body weight x 1 weekly for all sick bobtails)
- Dropper *Reptaca*® calcium supplement onto skin (1 drop/50g body weight x 2 weekly) for lizards not under UVA/UVB lighting

#### Diet for healthy bobtails

(Pre-release or long-term cases that are self-feeding)

Add firm fruits and vegetables to the above diet to toughen gums and palate.

eg. Sweet potato, apple, pear, green beans, grated carrot, rose petals

#### \*Meatball recipe

1 kg quality lean beef mince

85 g Turkey or chick starter

85 g Wambaroo Insectivore® powder

85 g Egg & Biscuit

$\frac{1}{2}$  Tablespoon Calcium carbonate

85 g SF40 Multivitamin powder

#### Release criteria

- The lizards must be healthy, self-feeding and alert, exhibit a menace response to people and pets and have good body condition.
- Bobtails mate for life so are usually returned to their home range if the site has no present danger due to dogs, traffic or toxins and has
  1. Adequate food and shelter (leaf litter, logs and under-story)
  2. Good weather forecast for several days after release
- Juveniles are released into their mother's territory, when healthy and their own body weight is above 140g
- Pregnant females are released after they deliver and return to health

During the colder months, when overnight temperatures drop below 10°C, fast pre-release bobtails (keep heat on) for several days, monitor stools and turn heat off after 3 days of no stools- release

#### Housing

Twelve *Ultimate Reptile Suppliers (URS)* polyethylene, seamless, stackable, small reptile vivariums (400x650x665mm) were arranged in a 4x3 bank on wheels for easy rear access.

Each unit has an *Exo-Terra* (360x360mm) heat pad beneath the floor and a 50-watt *Heat Glo* infrared basking spot lamp mounted into the ceiling

with small flat ceramic batten (plastic fittings will melt). Both are connected to a *Thermofilm model THAT 040*, thermostat set at 30°C. The heat and thermostat probe are located on one side of the vivarium to provide a heat gradient.

A *Reptistar* UV tube (18 inch) and aquarium lighting-reflector hood are set into the rear vent allowing 72% of UVA and UVB. The tube is connected to a timer set for natural photoperiods.

A 200mm diameter terra cotta pot-plant saucer is used as a water dish and to provide adequate humidity inside the vivarium.

#### Nebuliser

Omron Ultrasonic nebuliser model NE-U14 was used to deliver micro-particles (1 to 8 micrometres) of distilled water into a hospital box with a Perspex front, for approximately 10 minutes. The Perspex had a hole cut into it and a bracket fitted to hold the nebuliser safely in position. It was necessary to keep the nebuliser unit outside to prevent moisture entering the unit causing corrosion of the electrical/battery points.

Due to the numbers of bobtails treated (20 -25/day), a 4-x chamber manifold was connected to 4x 100mm diameter PVC pipes on a stand to hold each lizard during their nebuliser treatment.

#### Conclusion

Although an upper respiratory disease has devastated bobtail populations in the Western Australia, success rates are high if it is treated early. Veterinary care, good husbandry and rehabilitation methods are essential to the survival of this lizard and its live-born young. Ecological studies are being carried out by a Curtin University PhD student, to determine current numbers of bobtails and their conservation needs.

Wildlife carers can greatly assist the bobtail by alerting their community and providing quality care. The NWC conference is an excellent forum to raise awareness and discuss this disease and gain feedback from carers, veterinarians etc throughout Australia.

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