



Zoological Parks Board
of New South Wales

Australian Registry of Wildlife Health

The following are some interesting cases that have passed through the Registry recently. These reports originate from free-ranging animals, and native fauna held in a variety of zoos, fauna parks and private collections.

DECEMBER 2002

- NZ Fur seal - wild, NSW - emaciated fur seal, update from previous report (August 2002). The fur seal was found to have a very large gastric lymph node with extensive caseous necrosis and foci of mineralisation. Although mycobacteriosis was suspected on gross post mortem examination, histopathology revealed disseminated fungal infection. The fungus identified within the organs had a very unusual morphology and failed to sporulate in culture. Two mycology reference labs were unable to identify the fungus. PCR on the fungus was conducted at Westmead Hospital by Catriona Halliday and the organism was identified as *Aspergillus fumigatus*. From time to time some *A. fumigatus* isolates are apparently very difficult to identify (in humans, this is often attributed to prior anti-mycotic therapy). (3014.1)
- Green turtle - NSW, NPWS - Two green sea turtles being cared for at Sydney Aquarium from the outbreak of coccidiosis in October. Euthanasia elected to ongoing neurological dysfunction. Each animal had severe lesions in the brain, thyroid glands, kidneys, and intestinal tracts associated with the single celled parasite *Caryospora cheloniae*. Through the investigation of this outbreak we have better characterised the disease caused by this parasite and have identified a megaloschizont stage of the lifecycle. (3226.2, 3227.2)

During and shortly after the epizootic, a total of 13 green turtles, and four hawksbill turtles (*Eretmochelys imbricata*) were subject to gross and microscopic post mortem examination. Eleven of the sub adult and adult green turtles had systemic coccidiosis. Affected turtles ranged between 28.4 and 105 kg, with straight carapace lengths ranging between 615 and 940 mm. These animals were feeding on sea grass beds in estuaries along coastal NSW, particularly in Port Stephens.

Concurrent with the epizootic in green turtles were marine outbreaks of algal blooms attributed to *Trichodesmium erythraeum*. This alga was identified in large quantities in sea grass beds, and in the stomach content of several of the ill turtles. Stomach content from seven turtles and liver samples from five of the green turtles were analysed for the presence of several biotoxins. Hepatic microcystin concentrations ranging between 17.9 and 79.0 µg/kg were identified using an ELISA test. With funding from NSW NPWS, additional toxicological tests are underway to provide control samples, confirm that the test results are not a false positive due to binding with hepatic lipids, and further characterize the type of microcystin present.

- Long-nosed bandicoot - captive, NSW - Multiple lung abscesses, mycobacteriosis (3235.1). Qld reference lab confirmed atypical mycobacterium *Mycobacterium* sp. Slow Grower.
- Leadbeaters possum - captive, NSW - euthanased due to complications stemming from surgery to remove an infected portion of the reproductive tract. Due to the location of the infection, complete removal was not possible and some bacteria leaked into the peritoneal cavity. (3231.1)
- Scaly-breasted lorikeet - captive, NSW - chronic hepatitis with many intracellular bacteria. *E. coli* isolated in pure culture. Quite unusual for this bacterium to cause chronic liver disease. (3201.1)

- Bar-tailed Godwit - suspected tick toxicity (3236.1)
- Brushtail possum - wild, NSW - burned in bushfires. Multiple ulcers and areas of avascular necrosis of the skin, marked dehydration, and secondary bacterial infection (*Salmonella* sp) (3237.1).
- Eastern long-neck turtle - VIC - died due to dog attack, but had a severe, underlying inflammatory disease in the large intestine (multiple extensive granulomas throughout the colon wall) (3209.1).
- Little forest bat - VIC - euthanased due to trauma. Incidental finding of mites in the sinus cavity. Reported to be common, but we rarely see them due to the location (3212.1).
- Rainbow boas - SA - two small boas confiscated by customs and euthanased. One snake had ulcers associated with single celled parasites in the intestinal tract. This animal also had some unusual inclusion bodies in the kidney. We have seen several boas and pythons with large nuclei in the renal tubular epithelium. Some of these nuclei have peripheralised chromatin and contain amphophilic "polyoma-like" inclusion bodies. A DNA hybridization test to detect avian polyoma-virus was negative and unfortunately there are usually too few inclusions to chase with electron microscopy.

JANUARY 2003

- Bilby - captive, NSW - euthanased due to weight loss, dental attrition, the presence of a large, infected ulcer in the groin region containing the bacteria *Morganella morganii* and recent neurological deficits. The bilby had a systemic protozoal infection, which is morphologically consistent with sarcocystosis. Immunohistochemistry would be required to further confirm the identity of the organism. Most notably were protozoal zoites escaping from cysts within cardiac myocytes, and necrosis within the adrenal gland associated with large numbers of zoites. Smaller numbers of zoites were evident within small foci of necrosis and non-suppurative inflammation in the liver and pancreas (3317.1).
- Short-beaked echidna - rehabilitation, NSW - Euthanasia due to ongoing weight loss and marked bilateral conjunctivitis that had resulted in both eyes prolapsing. The animal's weight loss was a result of a combined infection with systemic coccidiosis and *Salmonella bovismorbificans*. We are noticing a trend, that echidnas dying with systemic coccidiosis have concurrent *Salmonella* septicaemia. This animal had coccidial gametocytes and oocysts within the conjunctiva, in addition to zoites in many of the parenchymatous organs (3260.1).
- New Zealand fur seal - wild animal that had been attacked by a shark, and then had been in quarantine. Biopsies from raised plaques in the oral cavity were morphologically consistent with papillomas (warts). The lesions may have resulted from the presence of a papilloma virus, or closely related virus. Papilloma virus has been reported to cause similar lesions in cetaceans and pinnipeds, but not NZ fur seals. Attempts will be made to confirm the presence of this virus. Papilloma viruses do not grow well in culture and immunohistochemistry will be required to confirm the diagnosis. Papilloma virus infections could be transmissible to other pinnipeds, but infections are usually self-limiting, and generally only occur in immunosuppressed animals (3254.1). The lesions were debrided on several occasions in the hopes that the procedure would act similar to an autogenous vaccine.
- Koala - NSW, NPWS - koala from a small population near Richmond, and thought to have been shot in a backyard. The koala had actually been attacked by a dog (3272.1).
- Green turtle - NSW, NPWS - young turtle markedly constipated due to the presence of large strings of plastic throughout the large intestine (3320.1).
- Centralian Carpet Python - NSW - Euthanased due to chronic respiratory illness and the identification of acid fast bacteria in a lung wash. The animal had many granulomas throughout the lung, and smaller granulomas throughout the liver and kidney, caused by *Mycobacterium abscessus* (3261.1).
- Brown Goshawk - wild, NSW - large granuloma extending through the thoracic wall probably from a puncture wound (3297.1).

FEBRUARY 2003

- Metallic starling - captive, NSW - severe dietary iron overload, *E. coli* infection around the liver, and enteritis associated with bacteria and yeast infections. (3356.1)
- Feathertail glider - captive, NSW - Animal had fungal sinusitis most likely caused by a strain of *Cryptococcus* species, and yeast within periodontal lesions, most likely *Candida* species (3299.1).
- Tammar Wallabies - captive, NSW - Outbreak of subacute to chronic sinusitis associated with *Bordetella bronchiseptica*. Two of the wallabies examined had evidence of concurrent meningitis with migrating nematodes (probably *Angiostrongylus cantonensis*). The wallabies had marked sinus congestion, and neutrophilic sinusitis and tracheitis. One wallaby had necrotising sinusitis that extended through the hard palate, down to a necrotising pharyngeal lesion. This animal had terminal systemic *E. coli* infection. Although *Bordetella bronchiseptica* was isolated within the lungs of some animals, this bacterium did not seem to spread systemically. Many of the animals examined had been ill for some time and had mobilised their fat stores. These animals were quite thin and had hepatic lipidosis. (3330.1, 3353.1 - 3353.4)
- Common wombat - NSW, NPWS - Carcase remains. One of many wombats thought to have been run over maliciously on the border of a national park and then buried (3333.1).
- Gippsland water dragon - NPWS confiscation - admitted emaciated, dehydrated and with a severe bacterial skin infection (3329.1)
- Bluetongue lizard - NPWS confiscation - ruptured stomach after gorging on mealworms (3407.1)
- Kakariki - captive, SA - euthanased due to the loss of several birds in the aviary after introduction of a group of Kakariki. The bird had inclusions in the Bursa of Fabricius that were consistent with Psittacine Beak and Feather disease. There were also many eosinophilic intranuclear inclusion bodies in hepatocytes, suggestive of a herpes virus or adeno virus infection. Due to the history and the fact that the bird was an exotic species, Pacheco's disease virus (an exotic herpes virus) had to be included in the differential diagnoses. NSW Agriculture and the SA agriculture departments were notified. Samples from this bird were sent to a specialist avian diagnostic laboratory in the USA, where DNA hybridisation was undertaken, but neither Pacheco's disease virus nor Psittacine Beak and Feather Disease were identified. DNA hybridization was selected rather than PCR, since formalin fixation modifies DNA so that it is unsuitable for PCR (3338.1).
- Australian Magpie - wild, NSW - released from a rehabilitation facility in January, but was brought back lame and unable to fly in February. Radiographic examination revealed bony proliferation along several long bones, where there did not appear to be any fractures. Euthanasia was elected, and post mortem examination revealed multifocal bony proliferation along the endosteum and periosteum of the long bones, a nodular bony lesion along the dorsal aspect of the sternum, and proliferation of the compact bone of the skull. The histologic lesions were highly suggestive of fluorine toxicity. Several similar cases are lodged in the Registry, as are a number of young magpies with rickets. Fluorine toxicity can cause large bony lesions in adult animals and rickets in young animals (where it binds to the bone substrate instead of calcium). Since fluorine toxicity can affect the development of bone and teeth in humans, EPA have agreed to conduct toxicological tests on the bone from this animal (3326.1).
- Red Kangaroo - SA - Skin biopsy: benign dermal cyst containing hair (3335.1).
- Red-winged parrot - wild, NT - severe skin wounds. Bacterial infection & candidiasis of the skin, in conjunction with inclusions consistent with Psittacine Beak and Feather disease (3283.1).
- Green tree snake - NT - cataract, squamous cell carcinoma of the oviduct (very unusual) (3305.1).
- Diamond Python - captive, SA - Euthanasia due to neurological disease. The snake had small numbers of basophilic smudgy intracytoplasmic inclusions in cells within the brain consistent with a diagnosis of Inclusion Body Disease of Boids (3343.1).
- Agile Wallaby - wild, NT - Biopsy of skin from a very crusty and ulcerative skin lesion in a young female wallaby. Sarcoptiform mites were identified in the skin scraping. Histologically the lesions are very similar to those of birds with *Cnemidocoptes* sp. infestations, and wombats with

Sarcoptes sp. infestation. Mites were forwarded to Dr. Ian Beveridge, University of Melbourne for identification (3399.1).

- Agile Wallaby - wild, NT - hand raised young, male wallaby with skin disease, emaciation, blindness and then death. The animal had a non-suppurative colitis and skin lesions as described in the animal above (3277.1).
- Black-headed pythons (2) - captive, NSW - multisystemic bacterial infections. Splenitis and hepatitis (3394.1, 3395.1).
- Green tree frog - captive, SA - euthanased due to an eye infection. The frog had multisystemic granulomatous inflammation associated with the fungus *Mucor* species (3339.1).
- Black faced cuckoo shrike - SA - subacute granulomatous enteritis and hepatitis. The lesions were suggestive of yersiniosis, but salmonellosis and other bacterial infections could not be ruled out without bacterial culture (3347.1)

MARCH 2003

- Koala - captive, NSW - died after several weeks suffering from a large ulcer on the tongue. Although a viral infection was suspected based on biopsies, no virus was isolated from the lesion. This is the second koala that we have seen that has died with severe, non-healing oral/pharyngeal ulcers (2265.5).
- Grey Nurse Shark - Wild, NSW Fisheries - found dead by divers 24 hours after being caught and tagged. The shark had acute foci of haemorrhage and inflammation in numerous tissues, suggestive of systemic bacterial infection, and it had a very large fishing hook that penetrated the oesophagus, coelomic cavity and lodged in the pericardium. The hook related lesions were very acute and it seems likely that the animal was caught twice within a short period of time, between the hooking and the subsequent manual catch and tagging. There was some concern regarding whether the tagging or the hook caused the shark's death. Foci of inflammation along the coelomic cavity were suggestive of bacterial spread from the fish hook site. The hook type found in the oesophagus is illegal, but only in some locations (3466.1).
- Australian Fur Seal - captive, NSW - aged animal, died with severe constipation and a very large hard faecal ball obstructing the large intestine and devitalising the intestinal wall. Terminal constipation is not uncommon in aged, captive pinnipeds. This animal had a thyroid cyst and bilateral thyroid adenomas, thus, its thyroid function was questionable. The animal also had haemosiderosis and fairly high concentrations of hepatic mercury (Liver Iron Levels - 18.8 mmol/kg wet weight, Liver mercury 220.00 mg/kg FW), liver moisture (% as received 69.50). It is uncertain whether heavy metal concentrations or abnormal thyroid function may have contributed to altered intestinal motility (3465.1).
- Superb Lyrebird - wild, NSW - hit by a car and sustained an eye injury. Euthanased after several weeks in rehabilitation due to severe debility. The bird had a contusion of the brain, and a ruptured lens, detached retina and secondary inflammation in the eye. The bird had marked fibrinous coelomitis and air sacculitis with *Providencia stuartii*, and *Pseudomonas aeruginosa*. It is possible that steroid administration to alleviate inflammation in the eye increased the bird's susceptibility to infection (3406.1).
- Superb Lyrebird - wild, NSW - found with a weak leg and some knuckling of the foot. The muscles of the limb were atrophic. The bird was euthanased after several weeks of care when it became paretic. A 2 cm segment of the sacral spinal cord was necrotic and surrounded with granulomatous inflammation. Pigmented fungi were present throughout the necrotic tissue and adjacent viable tissue. The bird had a focal fungal granuloma in the lung (*Aspergillus fumigatus*) (3406.1).
- Red-collared lorikeet - wild, NT - euthanased due to severe lumps in skin, predominantly over the head and neck. The bird had multiple intra-dermal cysts filled with large numbers of mites. The case is very similar to a Musk Lorikeet from SA, where the mites were identified as *Harpyrhynchus rosellasinus*. Mites from this lorikeet were submitted to Dr. Ian Beveridge, University of Melbourne, for identification.