

# Weight Loss Syndrome in Juvenile Free-living Galahs (*Eolophus roseicapillus*)

Bob Doneley  
University of Queensland Veterinary Medical Centre  
School of Veterinary Science, University of Queensland  
Gatton QLD 4343

## INTRODUCTION

Over the last ten years the author has seen many juvenile free-living galahs (*Eolophus roseicapillus*) presented by wildlife carers in south-east Queensland for severe weight loss and weakness associated with diarrhoea. Despite supportive care, most of the birds died. Over the last two years, an investigation into the cause of this syndrome identified two suspect pathogens: *Spiroucleus* spp and *Macrorhabdus ornithogaster*. This is the first report of these pathogens in free-living galahs in south-east Queensland.

## CASE REPORTS

Most affected birds were presented in October – March each year, coinciding with the spring breeding season. Many were so weak that they were unable to fly and easily caught by members of the public. On physical examination the birds were emaciated, with a prominent sternal carina and a weight range of 180-230g (normal 250-330g). The birds were severely dehydrated and usually had dark green-black mucoid diarrhoea. There was usually no physical evidence of Psittacine Beak and Feather Disease. Limited laboratory diagnostics have shown anaemia (PCV <25%) and hypoproteinaemia (<25g/L). Chlamydial serology (Immunocomb *Chlamydia psittaci*, Biogal) on two cases was negative. Faecal examinations failed to reveal intestinal parasites.

Supportive treatment (subcutaneous fluid therapy, warmth, tube feeding) and medications (doxycycline, metronidazole, and moxidectin), in most cases, failed to achieve any improvement and the birds were euthanased.

In the last two years approximately ten cases collected from the Darling Downs, Lockyer Valley and the Sunshine Coast were necropsied and the gastrointestinal tract submitted for histopathology at the UQ Veterinary Science Diagnostic Services laboratory (VSDS). Many of the birds were infected with varying loads of a *Spiroucleus* sp, and three were found to have proventricular ulceration associated with *M. ornithogaster*. A chronic hyperplastic enteritis was evident in many of the birds. In *Spiroucleus*-infected birds there were multifocal to coalescing, moderate to marked aggregates of protozoal organisms within the intestinal crypts and extending to the epithelial surface. These were approximately 5-7µm long, pear-shaped and flagellated (consistent with Hexamitidae family).

## DISCUSSION

*Spiroucleus* spp, formerly known as *Hexamita* spp, is a motile protozoan inhabiting the gastrointestinal tract of many species of birds. In turkeys, pheasants, Chukar partridges and peafowl

in the United Kingdom, Canada and the United States of America, it causes the disease known as infectious catarrhal enteritis, characterised by mucoid diarrhoea, weight loss, and death in juvenile birds.

Although *Spironucleus* spp were found to be affecting King Parrots in the Australian Capital Territory, New South Wales and Victoria, (Philby et al., 2002), and have been seen in galahs in Victoria (S. Raidal, personal communication), this is the first report of this parasite affecting free-living galahs in Queensland.

*Spironucleus* spp inhabit the gastrointestinal tract of a wide range of vertebrate hosts, including birds, fish, mice, and amphibians (Jorgensen and Sterud, 2007). It may be an important pathogen, or simply a commensal parasite. Most reports of disease in birds involve juveniles, suggesting that immunocompetence is a factor in the expression of disease (Philby et al., 2002; Cooper et al., 2004). The pathogenesis of enteric spironucleosis involves multiplication of protozoa in the intestinal lumen and crypts of Lieberkühn, the organisms deriving nutrition from digesta and crypt secretions and inducing catarrhal enteritis. This intestinal damage may lead to malabsorption, maldigestion, weight loss and death (Philby et al., 2002).

Although frequently seen as motile protozoa in the intestinal lumen, *Spironucleus* cysts can be found in the mucus secreted from the intestinal tract in birds with enteritis. This mucus may protect the cysts outside the host's body and contribute to its infectiveness (Wood and Smith, 2005). Free-living juvenile galahs are frequently 'crèched' by their parents in a common locality; an important part of their social development (Forshaw, 2002). It is possible that this close proximity, while still not fully immunocompetent, might explain the incidence of this disease in juvenile galahs.

Treatment for spironucleosis revolves around the use of nitroimidazoles (dimetridazole, metronidazole, carnidazole and ronidazole). Although birds treated early in the disease course may recover and survive, many of those presented fail to respond and die or are euthanased. This is more likely a reflection of the severity of the changes seen in the intestinal epithelium, rather than the presence of the organism itself.

*M. ornithogaster* (Megabacteria, Avian Gastric Yeast) is an anamorphic ascomycetous yeast found only in the proventriculus of birds. Infection is often benign but has also been associated with disease in some species of birds under some circumstances (Hannafusa et al., 2007). It was first recognised as a disease entity in the 1980s, and there is still controversy as to whether it is an emerging disease (perhaps spread by the world-wide trade in birds), or a previously unrecognised, but widespread, disease. It has been reported in a wide range of bird species, both captive and free-living.

Typically, affected birds show chronic wasting, often associated with a ravenous appetite, vomiting and diarrhoea. Severe emaciation usually results in death; necropsy reveals ulcerative lesions in the proventricular isthmus. Ante-mortem diagnosis can be made of the microscopic examination of fresh faeces; post-mortem diagnosis can be achieved through the same examination of a scraping of the mucosal surface of the proventricular isthmus. Transmission appears to be by the faecal-oral route.

Treatment for macrorhabdosis appears to be most successful when amphotericin B is used (100mg/kg PO twice daily for 30 days). Recently the use of sodium benzoate in drinking water appears to offer a more cost-effective treatment (David Phalen, personal communication).

The compounding effects of other concurrent disease in juvenile free-living galahs should not be overlooked. McOrist et al. (1991) reported a similar syndrome in wild-caught cockatoos (*Cacatua galerita*) and galahs associated with an enterovirus. Affected birds developed similar clinical signs and lesions 2-7 days after capture for the pet trade. However, the authors did not see any parasitic or fungal infections in the birds they examined. Nevertheless, the presence of enteroviral infection in these galahs could be a contributing factor to their condition.

Chlamydiosis, Pbfd and aspergillosis have all been seen in some, but not all, affected birds in this study.

These diseases need to be included in the diagnostic approach to assessing a galah presented with severe weight loss and diarrhoea.

## **FURTHER STUDIES**

Further investigation into the weight loss syndrome in juvenile free-living galahs should include an understanding of the prevalence and incidence *Spironucleus* spp and *M. ornithogaster* in free-living galahs; improved diagnostic techniques; and treatment strategies to improve survivability.

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