

Spironucleosis in Australian wild birds

Fact Sheet

July 2025

Key points

- Spironucleosis is a protozoal disease of the gastrointestinal tract that causes weight loss and diarrhoea in wild and captive birds.
- It affects wild Australian king parrots, galahs and little corellas on the east coast of Australia.
- Diagnosis is by examination of motile protozoa in fresh faecal wet mounts.
- Treatment may be effective during early stages of disease but most affected birds fail to respond and are euthanised.
- The natural hosts, prevalence and environmental implications of infection are unknown.

Aetiology

Spironucleus (*Hexamitidae*) is a pear-shaped protozoa of the gastrointestinal tract of birds.

Spironucleus meleagridis is an important cause of infectious catarrhal enteritis in turkeys (*Meleagris gallopavo domesticus*), while *S. columbae* affects pigeons (*Columba livia*) and an uncharacterised species of *Spironucleus* affects wild Australian parrots ^[1].

One Health implications

Wildlife and the environment: spironucleosis is a transmissible cause of morbidity and mortality in wild birds in Australia, particularly young Australian king parrots (*Alisterus scapularis*) ^[1]. Population level impacts have not been observed, but are possible, particularly during periods of congregation and nutritional stress such as during drought.

Domestic animals: spironucleosis is associated with acute gastrointestinal disease in young captive game-birds, with the potential for high morbidity and mortality, and significant economic impacts to affected farms ^[2, 3]. Disease is primarily seen in commercially-reared turkeys, but has also been seen in pheasants, quail, chukar partridges (*Alectoris chukar*), and peafowl (*Pavo* sp.) ^[4, 5]. There is no direct link between spironucleosis in wild parrots and disease in farmed birds.

Humans: there is no evidence of human disease associated with avian spironucleosis.

Natural hosts

The natural hosts for *Spironucleus* are unknown. In wild birds in Australia, the organism causes disease most commonly in Australian king parrots throughout their natural range, and less commonly in wild galahs and little corellas ^[1, 6]. The organism has been recovered from the crop contents of apparently healthy captive budgerigars (*Melopsittacus undulatus*) in Perth, and has been observed in faecal smears of emaciated cockatiels (*Nymphicus hollandicus*) ^[7, 8].

Spironucleosis has been reported overseas in wild ducks (*Anas platyrhynchos*), sandhill cranes (*Grus canadensis pratensis*), demoiselle cranes (*Anthropoides virgo*), rheas (*Rhea americana*), ostrich (*Struthio camelus*), and pet scarlet-chested parakeets (*Neophema splendida*), budgerigars, cockatiels and pigeons ^[2, 8].

World distribution and occurrences in Australia

Spironucleosis has been reported in captive birds in the UK, Europe and North America, including captive Australian parrots in the UK.

Spironucleosis appears to have been affecting king parrots since at least 1984, by anecdotal reports ^[1]. *Spironucleus* has been found in wild birds in NSW, NT, ACT, Vic and Qld. Significant numbers of birds have been affected near Healesville and the Yarra Valley, Vic, and on the Gold Coast, Qld, however the proximity of these occurrences to large wildlife hospitals suggest that cases elsewhere may be under-reported ^[9].

Epidemiology

The prevalence of spironucleosis in wild bird populations is unknown. Transmission is by the faecal-oral route, and *Spironucleus* undergoes multiplication in the intestines, causing inflammation ^[6]. The incubation period is approximately 7 days. The mortality rate of infected wild king parrots presented to Healesville Sanctuary, Vic, is approximately 85% (Scheelings pers. comm.).

Affected wild Australian king parrots are usually juveniles that present during the winter months, possibly affected by cold weather or decreased availability of food. The organism likely persists in wild populations through carrier birds (infected birds that are clinically unaffected), and it is unlikely to survive in the environment for more than a few days ^[1, 10, 11].

The species of *Spironucleus* responsible for infections in Australian wild birds has not been identified. It is not known if the species affecting king parrots is the same as one that has occasionally been found in other bird species in Australia. It is not known why the organism appears to cause regular mortalities in king parrots but only rarely affects other species.

In captive birds, it is not known if *Spironucleus* is a commensal organism, opportunist, co-pathogen or primary pathogen, but it is associated with significant morbidity and mortality in captive cockatiels ^[2]. Concurrent infections, such as *Cryptosporidium*, *Salmonella*, *Plasmodium*, *Chlamydia*, *Rotavirus* and *Circovirus* are common, and may play a role in the pathogenicity of *Spironucleus* infection ^[2, 3, 12, 13].

Clinical signs

Spironucleosis affects mainly young birds ^[1, 14]. Clinical signs include lethargy, weakness, inappetence, emaciation, dark green or foamy diarrhoea, and faecal matting around the vent ^[15, 16]. Death occurs, on average, four days after presentation (ranging from one to 14 days) ^[1].

Clinical pathology

Spiro-nucleosis causes increased serum triglyceride, globulin and calcium in affected juvenile pheasants and partridges, and decreased phosphate. Mild infections in pheasants caused decreased total protein, albumin and osmolality, glucose, sodium, chloride and phosphate [5]. Affected Australian king parrots are often emaciated with decreased protein and electrolyte abnormalities [1].

Diagnosis

Diagnosis is based on clinical signs and faecal wet mounts demonstrating large numbers of motile protozoa with eight flagella and a gentle meandering forward motion [2, 17].

Laboratory diagnostic specimens and procedures

Faecal wet mounts, made from fresh faeces, intestinal contents or intestinal mucosal scrapings, should be examined promptly [2]. Infectious cysts can be found in the mucous secretions from the intestinal tracts of infected birds [6, 10].

A diagnostic PCR assay has been used to detect *S. meleagridis* in faecal samples from cockatiels, however further studies on the sensitivity of cloacal swabs, sample handling, and preservation methods are warranted [2]. A complete necropsy should be performed on birds that die, with a selection of tissues collected into formalin for histopathological investigation.

Pathology

Affected birds are emaciated and often have dilated, fluid filled loops of bowel with congestion of the small intestinal mucosa [8]. Food is often present in the gizzard and dark green or foamy faecal material in the cloaca [16].

Histologically, enteritis is evident with infiltrations of lymphocytes and plasmacytes and variable numbers of protozoa in intestinal crypts. The protozoa stain weakly with PAS and Giemsa, fail to stain with Ziehl-Neelsen and may be difficult to identify histologically within tissues [1, 8]. Villous pathology and invasion of spiro-nucleus trophozoites into the epithelium has been reported in a chukar partridge coinfecting with other pathogens [5, 8, 14].

Differential diagnoses

Differential diagnoses include other causes of emaciation, weakness and diarrhoea such as intestinal ascarids, other enteric protozoal, bacterial or viral infections and starvation.

Treatment

Survival rate is poor, regardless of treatment, and euthanasia may be required. Treatment, if attempted, involves metronidazole or ronidazole orally, along with fluid therapy, crop feeding, supplemental heat and other supportive care [18]. Birds that do survive spend an average of 4-8 weeks in care before being released.

Prevention and control

Prevention and control of spironucleosis is difficult in wild populations. As transmission is by the faecal-oral route, congregation at bird feeders may be a risk factor. Biosecurity practices should be put in place around feeding of wild birds, to minimise the risks. See WHA Fact Sheet [Biosecurity risk associated with feeding wild birds](#). For example, food and water should be changed daily and feeders disinfected with a 10% bleach solution.

Spironucleus muris cysts are resistant to low temperature, low pH, and desiccation, but are destroyed by prolonged exposure to heat, ethanol, sodium hypochlorite, zinc and sodium chloride [19].

Research

Further research into molecular characterisation, transmission studies and investigation of factors affecting disease expression is required to assess the effect of spironucleosis on Australian king parrot populations. Research is required to determine what factors change the carrier state to one of clinical disease. Development of effective treatment options are needed to improve outcomes for affected wild birds.

Surveillance and management

There is no targeted surveillance program for *Spironucleus* in Australian wild birds.

Wildlife Health Australia administers Australia's general wildlife health surveillance system, in partnership with government and non-government agencies. Wildlife health data is collected into a national database, the electronic Wildlife Health Information System (eWHIS). Information is reported by a variety of sources including government agencies, zoo based wildlife hospitals, sentinel veterinary clinics, universities, wildlife rehabilitators, and a range of other organisations and individuals. Targeted surveillance data is also collected by WHA. See the WHA website for more information <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance> and <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance/eWHIS-Wildlife-Health-Information-System>.

We encourage those with laboratory confirmed cases of this condition in native Australian or feral birds to submit this information to the national system for consideration for inclusion in the national database. Please contact us at admin@wildlifehealthaustralia.com.au.

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Wildlife Health Australia recognises the Traditional Custodians of Country throughout Australia. We respectfully acknowledge Aboriginal and Torres Strait Islander peoples' continuing connection to land, sea, wildlife and community. We pay our respects to them and their cultures, and to their Elders past and present.

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