Non Gastro-Intestinal Nematode Infections in Australian Birds

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The documentation of non gastro-intestinal nematode infections in Australian psittacines, passerines, ratites and wildlife appears sparse. Many such parasites occur on other continents and we have imported birds from these areas in the past. It would appear likely that some of these parasites would have been imported in the body cavities of these birds. It is also likely that we have our own Australian parasites affecting native species. Do they exist or are we not detecting them.

Nematodes can be divided into five groups

- Ascarids
- *Capillaria*
- *Spiruroidea*
- *Oxyspiroidea*
- *Syngamus*
- *Filaroidea*

Ascarids.

Most ascarids are intestinal and therefore won't be discussed here but one genus *Porrocecum* spp. has been described. Larvae of these species have been implicated in the development of tumours on the peritoneal surface of the intestines in European blackbirds(*Turdus merula*). They have also been documented in Australian Magpies(*Gymnorhina tibicen),* Currawongs, Corvids, quailthrush and pipits.(1)

Another North American ascarid *Baylisascaris procyonis* is a serious CNS parasite of mammals, birds and is potentially zoonotic. Over 40 species of birds and mammals have been reported to have been infected with this parasite and have displayed CNS signs.(2) This includes macaws(Ara Spp.)(3), a cockatiel(*Nymphicus hollandicus*)(4) and a Brush Turkey(*Alectura lathami*)(5). This ascarid is an intestinal parasite of raccoons (*Procyon lotor*). Birds are infected by eating raccoon faeces containing eggs or by eating contaminated foodstuffs. Eggs are long lived in the environment.

Infected birds show signs of depression, ataxia and torticollis prior to death. Acute and chronic infections occur. No gross lesions are evident at post mortem examination. Histology shows brain oedema.

Angiostrongylus cantonensis is a parasite present in Australia. It's natural host is the rat, where the larvae burrow up the spinal cord to the brain, then into the venous return to the pulmomnary arteries where they mature. It is known to produce meningio-encephalitis in dogs(6), man(7) and macropods(8).A suspected case of A. cantonensis infection in two yellow tailed black cockatoos (Calyptorhynchus funereus)is being investigated in Brisbane. (Gallagher AN and Monks D. Unpublished data).

Capillaria.

These are gastro-intestinal parasites and won't be discussed here.

Spruroidea.

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These are also gastro-intestinal parasites, primarily of the ventriculus.

Oxyspiroidea.

One member of this genus *Oxyspirura mansoni* causes eye lesions. This parasite occurs behind the nictitating membrane of the eye, in the naso-lacrimal duct or in the conjunctival sac. The parasite causes irritation, pruritus, epiphora and blepharospasm. Infection of passerines, psittacines and poultry has been reported in Australia.(1)

The life cycle is indirect and involves the cockroach as the intermediate host.
Treatment has been successful using direct mechanical extraction or ivermectin.(9)

Syngamus.

Syngamus trachea or gapeworm is a respiratory parasite of passerines, Corvids and gallinaceous birds. It has been documented in many Australian species. This parasite lives in the trachea where it causes inflammation and occasional obstruction. A haemorrhagic tracheitis has been documented in Emus(*Dromaius novaehollandiae*).Earthworms are presumed to be the intermediate hosts. Levamisole, ivomectin and fenbendazole have been found to be effective for treatment. Treatment often can lead to tracheal obstruction if large parasite numbers are present.(10)

Filaroidea.

Adults of these species live in the body cavity, eye, heart and air sacs of birds. All are characterised by the production of microfilaria which can be detected in blood smears. Examination of the buffy coat is the most effective method of detection. Most appear to be non pathogenic.

Serratospiculum amaculata and *Diplotriaena* sp. have been recorded in Lyrebirds(*Menura* sp.), finches and honey eaters(11). A fatal air sac infection with *Serratospiculum amaculata* has been recorded in a Prairie Falcon.(12).

Chandlerella quiscali is another filaroid nematode that has been documented as causing CNS disease in North America. This parasite has the Grackle as its natural host and is spread by *culicoides* spp. Larvae enter the blood stream and then migrate through the brain and spinal cord to the lateral ventricles of the brain where they mature. The mature parasites then produce microfilaria to complete the life cycle. Clinical signs of infections in Emu (Dromaius novaehollandiae) are torticollis and progressive ataxia.(13)(14). Histology of brain showed cross sections of filaroid parasites and mild to moderate peri-vascular cuffing and mild necrosis(13). Treatment appeared ineffective.

Pelecitus spp., Cardiofilaria spp., and Evimolama spp. have been recorded in psittacines overseas. Pelecitus spp. usually produce subcutaneous masses on the legs and feet.

An unidentified filaroid parasite has been associated with pathogenicity in an Umbrella cockatoo. It showed a one week history of anorexia, ataxia, diarrhoea and increased vocalisation. Microfilaria were located in the brain, lung, kidneys, heart, liver and spleen on post-mortem examination. Adult parasites were also found in the vena cava.(15)

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