

Can Doves Carry Psittacine Circovirus?

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Introduction

Psittacine beak and feather disease (Pbfd) is considered the most common viral disease of captive and wild psittacine birds in Australia.^{1,2,3} The disease may also occur naturally in other parts of Australasia but there is no evidence to support its occurrence in wild African or South American birds. International trafficking of psittacine birds out of Australia has probably been responsible for the occurrence of Pbfd in most countries where psittacine birds are kept.

In Australia, flocks of wild cockatoos may have a disease prevalence of 20% and a seroprevalence of 60-80%.^{2,3,4} Infection is probably maintained in a population by diseased and carrier birds. Virus transmission is probably predominantly by horizontal spread but carrier birds may contribute by vertical transmission. Virus infectivity probably persists in contaminated nests for many months or years.

Recent reports indicate that a similar viral infection also occurs in members of the Columbiformes.^{5,6} In pigeons the bursa of Fabricius is the main tissue affected. Feather lesions have not been described. In a recent review of 9 diseased pigeons (7 racing and 2 show birds) intracytoplasmic inclusions present within the bursa of Fabricius contained paracrystalline arrays of virus particles measuring 14-17 nm.⁵ The inclusions failed to stain by the immunoperoxidase method using monoclonal antibodies to psittacine derived circovirus. The inclusions stained weakly to moderately with a large (2 kilobase) DNA probe specific for psittacine circovirus. However, a small (30 base) DNA-probe failed to bind with the inclusions. This suggests that there is some DNA homology between the pigeon and psittacine circoviruses. However, analysis of the DNA sequences of the two viruses is required to determine their genetic relationship.

A disease which both clinically and microscopically closely resembles Pbfd has recently been reported in wild senegal doves in Perth.⁶ Affected doves had gross and histopathological feather lesions identical to those described for Pbfd. Faeces from affected doves contained low concentrations of haemagglutination activity which was inhibited by polyclonal antisera that contained antibodies to psittacine circovirus. Affected doves were seronegative to psittacine circovirus which could mean either that the birds were infected with an antigenically distinct virus or that they had failed to mount an effective immune reaction as is the case for chronically-diseased cockatoos.

The disease seen in wild doves in Perth is either caused by psittacine circovirus or a closely related virus. Propagation techniques using dove eggs or dove-derived cell cultures would be useful for studying the virus and for producing vaccine. The dove virus may be useful as an attenuated vaccine if it proves to be both non-pathogenic in psittacine birds and antigenically similar to psittacine circovirus.

Aims of the current research

If the disease in doves is caused by psittacine circovirus then doves may act as virus carriers and

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therefore spread infection to both wild and captive psittacine birds. We are currently conducting a survey to determine the prevalence of antibodies to psittacine-derived virus in populations of wild doves. If wild doves are endemically infected with psittacine circovirus then a high seroprevalence would be expected as is the case for wild and captive flocks of psittacine birds.^{3,4} Pathogenesis studies are also being performed to determine if doves are susceptible to infection with psittacine circovirus.

1. Pass DA and Perry RA: The pathology of psittacine beak and feather disease. Aust Vet J, 61, 69-74, 1984
2. McOrist S, Black DG, Pass DA, et al: Beak and feather dystrophy in wild sulphur-crested cockatoos (*Cacatua galerita*). J Wildl Dis 20, 120-124, 1984
3. Raidal SR, McElnea C and Cross GM: Seroprevalence of psittacine beak and feather disease in wild birds in New South Wales. Aust Vet J, 70, 137-139, 1993
4. Raidal SR and Cross GM: Control by vaccination of psittacine beak and feather disease in a mixed flock of *Agapornis* spp. Aust Vet Prac 24, 178-180, 1994
5. Woods LW, Latimer KS, Niagro FD, et al: A retrospective study of circovirus infection in pigeons. J Vet Diagn Invest 6:156-164, 1994
6. Pass DA, Plant SL and Sexton N: Natural infection of wild doves (*Streptopelia senegalensis*) with the virus of psittacine beak and feather disease. Aus Vet J,