

RHODOCOCCLUS EQUI INFECTION IN BLANFORD'S FOXES INFECTED WITH DISTEMPER VIRUS

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In 2008-2009 three Blanford's foxes (*Vulpes cana*) kept at the Breeding Centre for Endangered Arabian Wildlife in the United Arab Emirates died acutely with severe pneumonia. *Rhodococcus equi* (*R. equi*) was cultured and later confirmed by PCR. Serology and PCR revealed a concurrent infection with distemper virus in two of the three cases.

Rhodococcus species are a group of Actinobacteria (Nocardiaceae) that are largely environmental organisms known for their biodegradable properties (TB, 2009; RGP, 2009). They can be pathogenic for plants (Agrios, 2005), animals (Prescott 1991; Yassin, 2005) and humans (Graham et al., 2007). *R. equi* is best known for causing pneumonia and lung abscesses in foals (Muscatelo et al., 2009; Prescott, 1991). The bacterium can be found in soil and is commonly detected in the faeces of herbivores (Prescott, 1991). Human *R. equi* infections are usually seen in immunocompromised patients (Kwa et al., 2001; Puthuchery et al., 2006). Only a few cases have been reported in cats and dogs (Takai et al., 2003; Prescott, 1991).

Since *R. equi* is usually described as a secondary infection, possible underlying causes were investigated. PCR carried out on post mortem samples of the first two foxes were both positive for distemper virus infection. The last fox that died had a negative PCR for distemper. Serum samples of all unvaccinated foxes were tested for distemper IgG and IgM antibodies. All nine Blanford's foxes and all eight Sand foxes tested, showed distemper antibodies although no illness or mortality in the past could be related to this infection. Uncomplicated distemper virus did not seem to cause symptoms in the foxes and clinical problems and mortality were only seen in association with the *R. equi* related pneumonia. Most likely the distemper virus decreased the immune response, resulting in acute mortality due to secondary bacterial infection.

R. equi is widespread in the environment and infection occurs commonly in horses. The infection might be underreported in other species such as in canids because of the difficulty of interpreting culture. The bacteria are Gram variable and can appear both as cocci and rods in the culture. The prevalence of a morphologic type can change with every subculture of the organism. The staining and morphologic variability can make it rather easy for *R. equi* to be overlooked in mixed cultures or misidentified as diphtheroids, Mycobacterium species or Nocardia, during a routine bacteriological examination (Puthuchery et al., 2006).

Fig. 1: Blanford's fox.

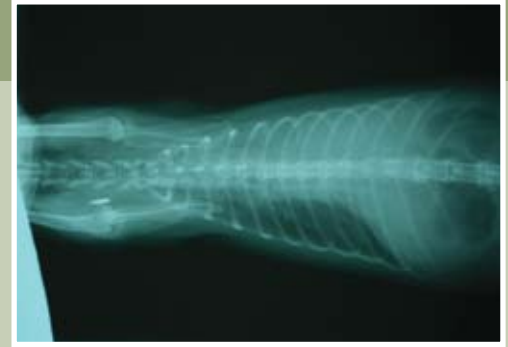


Fig. 2: Radiograph showing consolidated lung tissue.

The high prevalence of distemper antibodies in the foxes draws attention to how widespread the virus is in the region. Vaccination of canids against distemper should therefore be considered. The vaccine commonly used in dogs is however a modified live vaccine which has been reported to cause vaccine induced distemper resulting in high mortality in many non-domestic species (Montali et al., 1994; Deem et al., 2000). Therefore a recombinant canary pox vectored vaccine such as the commercially available Purevax distemper® (Merial) as used for ferrets is recommended for all non-domestic canids (Bauman et al., 2010). This vaccine is however not available in all countries and might have to be imported from abroad.

This case also emphasises the importance of co-infections. Uncomplicated distemper infection seems not to lead necessarily to clinical disease but makes the animal more susceptible to other concurrent infections. This has also been noted in other species such as during the distemper outbreaks in the Serengeti lions and Santa Catalina foxes where infections with respectively Babesia and Toxoplasma contributed to mortalities (Munson et al., 2008). Knowing these co-pathogens has consequences for deciding on appropriate treatment and for making a prognosis.

References:

A fully referenced version is available for download on the WMENews website.



Fig. 2: Post mortem examination showing necrotic pneumonia.