Serodiagnosis of aspergillosis in falcons (*Falco* spp.) by Afmp1p-based enzyme-linked immunosorbent assay

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Introduction

- Aspergillosis has emerged as one of the main health problems in raptors (e.g. falcons)
- Falcons with aspergillosis have a high mortality rate
- Diagnostic methods include endoscopy, mycological culture and cytology/histology, etc.
- Afmp1p is a cell wall galactomannoprotein of *Aspergillus fumigatus*, which is highly antigenic
- Anti-Afmp1p antibodies were detected from sera of human aspergillosis patients by Afmp1p-based ELISA → Potential use for diagnosing human cases
- Hypothesis:** Could this Afmp1p-based ELISA be used for serodiagnosis of aspergillosis in falcons?

Methodology

- Generation and characterisation of a guinea pig polyclonal HRP-conjugated anti-falcon IgY
- Experimental infection with *A. fumigatus*
 - Three peregrine falcons (*Falco peregrinus*), one as negative control
 - Four saker (*F. cherrug*) × gyrfalcons (*F. rusticolus*), two as negative controls
 - Detection of immunoreaction between recombinant (r)-Afmp1p and sera from experimentally infected falcons
- ELISAs
 - rAfmp1p as coating antigen
 - Characterisation of antibody response of the experimentally infected falcons
 - Evaluation of the anti-Afmp1p-based ELISA system using serum samples from captive-bred falcons (12 with and 129 without aspergillosis) collected in a clinic in Dubai, UAE

Results

▼ Titre and detection limit of anti-falcon IgY

Results

▼ Necropsy and histology of an experimentally infected falcon

▲ Anti-falcon IgY is specific to falcons

◀ Presence of anti-Afmp1p antibodies in falcon serum post-infection (day 50)

► Serum anti-Afmp1p antibody profiles of the experimentally infected falcons (P, peregrine falcons; SG, saker × gyrfalcons; P3, SG3 & SG4 are uninfected negative controls)

◀ Evaluation of the Afmp1p-based ELISA system using 141 field sera (OD_{450nm} cut-off = 0.407)
Sensitivity = 75%
Specificity = 99.2%

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Reference

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