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# ESTABLISHMENT OF A PILOT AVIAN MONITORING HEALTH SCHEME IN THE UNITED ARAB EMIRATES USING WILD MALLARDS (*ANAS PLATYRHYNCHOS*).

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**KEYWORDS**

Mallard – Surveillance – *Chlamydophila* – Virology – Microbiology

**ABSTRACT**

Wild waterfowl have been widely recognized as carriers of numerous avian pathogens. This, in conjunction with the fact that they interact with captive birds during feeding obviates the potential threat of disease introduction into closed populations.
Over a period of three months, a surveillance programme was carried out in the lakes of Wadi al Safa Wildlife Centre (WASWC), Dubai, UAE, using migrating wild mallards (*Anas platyrhynchos*).
In total, thirty apparently healthy mallards were trapped, and the presence of various avian pathogens (bacteria, virus and parasites) was investigated.

## 1 INTRODUCTION

The potential dissemination of numerous pathogenic micro organisms by migratory birds is well-documented (BAHL et al. 1974; HUBALEK 2004; MUNSTER et al. 2005).
At WASWC (N 25 10.666' E 055 33.452), Dubai, UAE, a series of artificial lakes accommodate a captive waterfowl population comprising of fulvous tree ducks (*Dendrocygna bicolour*), black necked swans (*Cygnus melanocoryphus*), European shelducks (*Tadorna tadorna*), radjah shelducks (*Tadorna radjah*) and European wigeons (*Anas penelope*). In recent years, losses have been incurred in these captive bird populations due to infectious disease. Of paramount concern is the disease threat due to migrant populations of wild birds present in the lakes. These are mainly mallards, but also include black winged stilts (*Himantopus himantopus*) and waterhens (*Amaurornis phoenicurus*). In order to explore the role played by mallards in pathogen introduction, a pilot surveillance programme was initiated. The objectives of this surveillance were to identify those pathogens prevalent in wild waterfowl in the region and to assess the risk of disease propagation to captive populations of birds.

## 2 MATERIAL AND METHODS

Over a three month period (December 2005- February 2006) six batches of apparently healthy mallards, totalling 30 birds, were captured using a big cage trap in WASWC, Dubai, UAE. Pooled oropharyngeal and cloacal swabs were taken from each batch at the capture site and subjected to a rapid H5 antigen detection test (Anigen Rapid H5 Avian Influenza Antigen Test, Animal Genetics, Korea). All birds received a complete clinical examination at the Dubai Falcon Hospital. Under general anaesthesia, samples were taken for haematology, bacteriology, virology and parasitology in addition to a whole body fluoroscopic examination. After euthanasia, necropsy and histopathological examinations were carried out.

Blood samples were obtained from the medial metatarsal or the basilic vein. Swabs from oropharynx and cloaca were cultured in sheep blood agar and MacConkey's agar and incubated respectively in a 5% $CO_2$ and in an aerobic atmosphere at 37ºC for 48 h. Pooled swabs from trachea and cloaca were collected in special media for the detection of avian influenza, *Chlamydophila* and virus isolation in the Central Veterinary Research Laboratory (CVRL). An enzyme immunoassay for the detection of *Chlamydophila* antigen (lipopolysaccharide) was used (Ideia Chlamydia, DakoCytomation). Virus isolation was attempted in embryonated chicken eggs as well as in cell culture (chicken embryo fibroblasts). Two additional tests were used at CVRL for avian influenza investigation: an antigen test for type A avian influenza, (Directigen Flu A, Becton-Dickinson) and a serological technique, the haemagglutination inhibition (HI) test, specific for the H5N2 antigen. Parasitological investigations comprised of direct smears of crop and faecal swabs stored in saline solution. Moreover, parasites collected during necropsy from the gastrointestinal tract were saved and later identified. All mallards were examined under fluoroscopy for 5 minutes.

## 3 RESULTS

### 3. 1 Bacteriology

No pathogens were cultured from oropharyngeal or cloacal faecal samples. Moreover, post-mortem microbiology from selected organs did not reveal pathogenic bacteria. A significant percentage (18/30; 60%) of mallards tested positive to ELISA for *Chlamydophila* antigen.

### 3. 2 Virology

No viruses were isolated from pooled tracheal and cloacal swabs. All birds tested negative to the rapid H5 antigen test, but at least one mallard in a batch of 5 tested positive for the Influenza type A antigen. In 7 mallards (7/30; 23%) low titres (1/8 - 1/32) to the antigen H5N2 were detected using HI test.

### 3. 3 Parasitology

No adult parasites or ova were observed in swabs from crop or faeces. However, investigation of gastrointestinal tract during post-mortem studies revealed some adult cestodes, nematodes and trematodes. Biting lice were the only ectoparasites detected (3/30; 10%).

### 3. 4 Others

Haematological parameters were within normal ranges. No monocytosis was observed in ducks positive to *Chlamydophila*. Fluoroscopy revealed lead pellets in only one bird.
The most remarkable post-mortem findings were: mild interstitial hepatitis (2), old microabcesses in liver (4), granulomas in liver (1), microabcesses in lung (1), focal bronchitis (1) and focal demyelinisation in brain (1).

## 4 DISCUSSION

Our study of culled mallards provided an opportunity to assess pathogens circulating within migrating populations of waterfowl in the region and highlights the relative risk of disease dissemination to closed captive populations, which they represent.

*Chlamydophila* is an obligate intracellular bacterium, which has been reported in numerous species of birds worldwide. Several avian serovars are thought to exist and a strain asymptomatic in one bird species may be highly pathogenic in another (GERLACH 1994). That 60 per cent of birds were positive using the *Chlamydophila* antigen must be interpreted with caution. Actual infection rates may well be higher as many animals may not have been shedding at the time of sampling. Chronic or low grade *Chlamydophila* infection results in a range of systemic pathological changes including hepatosplenic lesions (GERLACH 1994) such as the mild interstitial hepatitis described above.
Humans working close to these birds should take into consideration the zoonotic potential of *Chlamydophila* and wear face-masks when appropriate.

Virology results suggest a possible silent circulation of many serotypes of avian influenza in the wild mallards. Pathogenic H5N1 has not yet been detected in UAE, but the risk implications are obvious. Although there is presently a deficit in the knowledge pertaining to the likely migration routes undertaken by the birds involved in this study (S. ASPINALL, personal communication), knowledge of existing migration routes and variations thereof gained from ringing or more advanced tracking methodology is imperative to accurate retrospective epidemiological studies, as demonstrated during recent outbreaks (DEFRA 2006).

The parasites found in the gastrointestinal tract were consistent with the species known to affect waterfowl in other areas (FARIAS and CANARIS 1986; SHAW and KOCAN 1980) and did not seem to cause severe disease in these birds.

In the future we would like to extend our surveillance to incorporate additional avian pathogens and sample other wild birds species present in the lakes.

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## 6 CITATION INDEX

1. BAHL AK, POMEROY BS, EASTERDAY BC, MANGUNDIMEDJO S. Isolation of type A influenza viruses from the migratory waterfowl along the Mississippi flyway. J Wildl Dis 1974; 11: 360-363.
2. DEFRA. Highly Pathogenic Avian Influenza (H5N1) in dead swans in Europe. http://www.defra.gov.uk/animalh/diseases/monitoring/pdf/hpai-europe160206.pdf (accesed 25.10.2006)
3. FARIAS JD and CANARIS AG. Gastrointestinal helminths of the Mexican duck, *Anas platyrhynchos diazi* ridgway, from North central Mexico and Southwestern United States. J Wildl Dis 1986; 22(1): 51-54.
4. GERLACH H. Chlamydiosis. In: RITCHIE, B, HARRISON, R., and HARRISON, J. (Eds.) 1994. Wingers Publishing Inc. Lake Worth, Florida.
5. HUBÁLEK Z. An annotated checklist of pathogenic microorganisms associated with migratory birds. J Wildl Dis 2004; 40(4): 639-659.

6. MUNSTER VJ, WALLENSTEN A, BAAS C, RIMMELZWAAN GF, SCHUTTEN M, OLSEN B, OSTERHAUS A, FOUCHIER R. Mallards and highly pathogenic avian influenza ancestral viruses, Northern Europe. Emerg Infect Dis 2005; 11(10): 1545-1551.
7. SHAW MG and KOCAN AA. Helminth fauna of waterfowl in Central Oklahoma. J Wildl Dis 1980; 16(1): 59-64.

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