Avian TB – a selection of references from a search in CAB Abstracts database

<1>
Accession Number
20173056554
Author
Tait, P.; Saunders, C.; Nugent, G.; Rutherford, P.
Title
Valuing conservation benefits of disease control in wildlife: a choice experiment approach to bovine tuberculosis management in New Zealand’s native forests.
Source
Journal of Environmental Management; 2017. 189:142-149. many ref.
Publisher
Elsevier
Location of Publisher
Amsterdam
Country of Publication
Netherlands
Abstract
We assess the non-monetary environmental benefits that accrue incidentally in New Zealand (NZ) from pest management conducted primarily to control an animal disease, bovine tuberculosis (TB). TB is an infectious disease that is one of the world's most serious animal health problems and, in many parts of the developing world, still a major mortality risk for humans. The incidence of TB in New Zealand (NZ) farmed livestock has been reduced progressively over the last 20 years, largely due to extensive and sustained population control of the main wildlife reservoir of disease, the introduced brushtail possum. Possums are also major pests that threaten indigenous forest biodiversity, and so extensive possum control for TB mitigation also incidental benefits conservation, but the extent and public value of this benefit has yet to be quantified. We conducted a choice experiment survey of the NZ public in an effort to value the native forest biodiversity benefits of TB-related possum control. We find strong public support for conservation outcomes consequent to TB-possum control in public native forests. The public place substantial value on the most observable biodiversity benefits of TB possum control, such as improved forest canopies and presence of native birds. The benefits, costs and values of TB-possum control are discussed in relation to the future directives of NZ’s TB control programme, which is headed toward first regional and then national level disease eradication.
Publication Type
Journal article.

<2>
Accession Number
20163330712
Author
Zhu DeKang; Song XiaoHeng; Wang JiangBo; Zhou WangShu; Ou XuMing; Chen HongXi; Liu MaFeng; Wang MingShu; Ji RenYong; Chen Shun; Sun KunFeng; Yang Qiao; Wu Ying; Chen XiaoYue; Cheng AnChun
Title
Outbreak of avian tuberculosis in commercial domestic Pekin ducks (Anas platyrhynchos domestica).
Source
Avian Diseases; 2016. 60(3):677-680. 28 ref.
Publisher
American Association of Avian Pathologists
Location of Publisher
Athens
Country of Publication
USA
Abstract
Avian tuberculosis is a contagious disease affecting various domestic and wild bird species, and is caused by Mycobacterium avium. It is reported extremely rarely in commercial poultry flocks and has not been reported in commercial domestic ducks to date, with domestic ducks reported to be moderately resistant to M. avium infection. Here, we report the outbreak of avian tuberculosis in commercial Pekin duck (Anas platyrhynchos domestica) flocks. Postmortem and histopathologic findings included nodules presenting in the visceral organs of ducks, and granulomas with central caseous necrosis surrounded by infiltrating lymphocytes. The M. avium pathogen was isolated and further identified by Ziehl-Neelsen staining and PCR based on insert sequence IS901 and the 16S rRNA gene. We highlight that avian tuberculosis not only has economic significance for the duck industry, but also presents a potential zoonotic hazard to humans.
Publication Type
Journal article.
The mycobacterial infections caused by strains of Mycobacterium avium complex (MAC) in animals and humans are still present. Mycobacterium avium subsp. avium (MAA) is the etiologic agent of avian tuberculosis, a chronic contagious disease described in a wide variety of domestic and wild bird species. The aim of this study was to evaluate the advantage of using the MB/BacT bottles in an automated system and PCR method for rapid identification of the etiologic agent of tuberculosis in hens. The culture samples isolates from hens in the MB/BacT automated system and PCR amplification of insertion element (IS1245, IS901) it was a faster and specific method.

Abstract:
A male Long-legged buzzard with a gunshot wound on his left wing was presented for treatment. However, the bird died shortly after, and then the routine necropsy was performed. At necropsy, numerous white-to-yellow nodular lesions sizing several mm to 1 cm in diameter were noted in liver, spleen, gizzard and lung. Microscopic examination of the nodules in lung and gizzard revealed classical formation of tubercles characterized by a caseous core surrounded by epitheloid cells, multinucleated giant cells, heterophils, macrophages, and outer fibrous capsule. Fibrous capsule formation was vague in tubercles located in liver.
and spleen. Acid fast bacteria were shown by Ziehl-Neelsen staining. Based on the observations a diagnosis of avian mycobacteriosis was made. This report indicates that avian tuberculosis might be an important disease in free living animals in Turkey as in other places, and more attention might be needed to monitor the disease.

Publication Type
Journal article.

</6>
Accession Number
20163129191
Author
Sanchez, F. D.; Yela, I. J.; Alfonseca, E.; Campuzano, J.; Morales, E.; Aguilar, C.
Title
Respiratory tract infection caused by Mycobacterium bovis in a black swan (Cygnus atratus).
Source
Avian Pathology; 2016. 45(1):126-131. 34 ref.
Publisher
Taylor & Francis
Location of Publisher
Abingdon
Country of Publication
UK
Abstract
A 3-year-old male black swan (Cygnus atratus), belonging to a private collection, died suddenly and was subjected to post mortem examination. At necropsy, caseous exudate was observed in the lungs and air sacs; granulomatous lesions characterized by epithelioid macrophages and abundant mycobacteria were observed microscopically. Avian tuberculosis associated with Mycobacterium bovis was confirmed by bacteriologic isolation, biochemical tests and molecular methods. The organism was identified as spoligotype SB0140, which is frequently found in cattle and people in North America. In this case, interspecies transmission could have been the source of infection because the swan cohabited with cattle.

Publication Type
Journal article.

</7>
Accession Number
19972216319
Author
Thorel, M. F.; Huchzermeyer, H.; Weiss, R.; Fontaine, J. J.
Title
Mycobacterium avium infections in animals. Literature review.
Source
Veterinary Research; 1997. 28(5):439-447. 67 ref.
Abstract
Mycobacterium avium causes tuberculosis in chickens and other fowls but can also infect an extensive range of different animal species. The authors review the available literature on this organism to show the importance of M avium infection.

Publication Type
Journal article.
Avian mycobacteriosis caused by Mycobacterium avium subspecies avium in four ornamental birds and in vitro drug sensitivity testing of isolates.

Avian tuberculosis, one of the most important diseases affecting various species of birds, is most often caused by Mycobacterium (M.) avium. This report describes cases of M. avium subsp. avium (MAA) infection in a white-crested Holland dwarf rooster, a male and a female golden pheasant and a male peacock. We also investigated the prevalence of mycobacteria in 60 other birds and 40 alpacas. Tissue samples of necropsied birds were cultured for mycobacteria. From non-necropsied 60 other birds and alpacas only faecal samples were collected. Clinical signs in the affected white-crested Holland cock included gradual loss of body weight and hoarse attempts at crowing during its last 3 weeks, with a dramatic loss of body condition and depression over the final week. Only slight weakening was observed in the peacock just before its death, and the golden pheasants died suddenly. Diagnosis was confirmed by microbiological, molecular and pathological results. Mycobacterium avium subsp. avium strains were isolated from the internal organs of the affected birds. Only one faecal sample from 60 other birds was culture- and PCR-positive for M. avium subsp. avium, while another one was only PCR-positive for M. chelonae. We did not isolate any Mycobacterium spp. from faecal samples of alpacas and all of them were PCR-negative. All 18 isolated M. avium strains were resistant to rifampicin, isoniazid, ethambutol, ethionamide, capreomycin and ofloxacin, and susceptible to cycloserine and streptomycin.

Avian tuberculosis in a captive cassowary (Casuarius casuarius).

Avian tuberculosis in a captive cassowary (Casuarius casuarius).
The paper describes avian tuberculosis in a captive bred cassowary. A two-and-a-half-year-old bird was obtained by a Polish zoo in 2010 from the Netherlands under conditions compliant with the recommendations of the European Association of Zoos and Aquaria. Despite being of small size for the age, the bird appeared healthy and showed no signs of the disease until the day it was found recumbent in its pen. Later on it was euthanised due to lack of treatment possibilities. Pathological changes typical of avian tuberculosis were found in the liver and spleen. Mycobacterium avium ssp. avium was cultured from both organs.

Publication Type
Journal article.
Abstract
The aim of this study was to investigate the histopathology of avian tuberculosis in naturally infected domestic pigeons (Columba livia var. domestica) with Mycobacterium avium subsp. avium. Avian tuberculosis is one of the most important diseases that affect all species of birds, and is most often caused by Mycobacterium avium and Mycobacterium genavense. 80 out of more than 600 pigeons were selected based on their clinical signs and poor health conditions and under standard conditions were euthanized, necropsied, followed by bacterial culture on specific media for Mycobacterium avium subsp. avium. Fifty Mycobacterium avium subsp. Avium were isolated from pigeons. All acid-fast bacilli isolates were tested by the PCR assays targeting the 16S rRNA, IS1245 and IS901 genes. After definitive identification of Mycobacterium avium subsp. avium by culturing and PCR assay, 45 fixed samples including liver, gizzard, proventriculus, intestines, kidneys and lungs from positive pigeons were subjected for histopathology studies. Tissues sections were prepared as usual and stained by haematoxylin and eosin, Ziehl-Neelsen and Congo red. Based on gross findings, liver and intestines were the most affected organs. Histologically, caseative uncalcified granulomatous inflammation was noticed in the affected organs. Also histopathology examinations showed that most of the granulomatous lesions in the lungs were in microscopic size and it seems that lungs were affected more than it was expected. In Ziehl-Neelsen's staining, a large number of acid-fast bacilli were observed within multinucleated giant cells and in necrotic areas. Also in Congo red staining, deposition of amyloid in liver and kidneys sections were observed. In conclusion, histopathology findings were typical of avian tuberculosis, including acid-fast bacilli and uncalcified caseous necrosis centers that were surrounded by multinucleated giant cells, macrophages and lymphocytes.

Publication Type
Journal article.
Avian tuberculosis is a chronic disease caused mainly by Mycobacterium avium in birds. The disease has a worldwide distribution affecting primarily adult birds because of its long incubation period, making it a common disease in zoo and breeding establishments. Mycobacterium avium is highly resistant to environmental challenges and can survive in soil for up to 4 years. It is spread by ingestion of food or water contaminated by faeces from birds which shed the organism. Despite the low zoonotic risk, the disease is more likely to affect human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) patients and other immunocompromised individuals. Mycobacterium avium causes serious disseminated bacterial infection in up to 40% of patients with advanced HIV infection indicating its public health importance as a disease. Control of the disease poses a serious challenge, owing to the presence of the disease in wildlife. This review covers the general knowledge on avian tuberculosis, diagnostic methods, zoonotic implications and challenges faced in the control and eradication of the disease.

Infectious bursal disease (IBD) is an acute, infectious, immunosuppressive disease affecting young chicken worldwide. The etiological agent IBD virus (IBDV) is a double stranded RNA virus with outer capsid protein VP2 of IBDV is the major antigenic determinant capable of inducing neutralizing antibody. DNA vaccines encoding VP2 has been extensively studied achieving only partial protection. However, the efficacy of DNA vaccines against IBDV can be augmented by choosing a potential molecular adjuvant. The goal of the present study is to evaluate the immune response and protective efficacy of a DNA vaccine encoding the C-terminal domain of the heat shock protein 70 (cHSP70) of Mycobacterium tuberculosis gene genetically fused with the full length VP2 gene of IBDV (pCIVP2-cHSP70) in comparison to a 'DNA prime-protein boost' approach and a DNA vaccine encoding the VP2 gene (pCIVP2) alone. The results indicate that both pCIVP2-cHSP70 and 'DNA prime-protein boost' elicited humoral as well as cellular immune responses. Chickens in the pCIVP2-cHSP70 and 'DNA prime-protein boost' groups developed significantly higher levels of ELISA titer to IBDV antigen compared to the group immunized with pCIVP2 alone (p<0.01). However, significantly higher levels of lymphocyte proliferative response, IL-12 and IFN- gamma production were found in the pCIVP2-cHSP70 group compared to 'DNA prime-protein boost' group. Additionally, chickens immunized with pCIVP2-cHSP70 and 'DNA prime-protein boost' vaccines were completely protected against the vvIBDV whereas pCIVP2 DNA vaccine alone was able to protect only 70%. These findings suggest that the truncated C-terminal HSP70 mediated DNA vaccine genetically fused with the VP2 gene construct stimulated both humoral and cell mediated immune responses and conferred complete protection against...
IBDV. This novel strategy is perhaps a seminal concept in utilizing HSP70 as an adjuvant molecule to elicit an immune response against IBD affecting chickens.

Publication Type
Journal article.

<14>
Accession Number
20143294702
Author
Miranda, A.; Pinto, M. L.; Pires, M. A.; Coelho, A. M.; Sargo, R.; Sousa, L.; Garcia-Diez, J.; Matos, M.; Coelho, A. C.
Title
Increased detection rate for Mycobacterium avium complex with combination of molecular techniques (PCR 16S rDNA, PCR "multiplex") in exotic pet birds. [Spanish]
Source
REDVET; 2013. 14(12):121303. 23 ref.
Publisher
Veterinaria Organizacion S.L.
Location of Publisher
Malaga
Country of Publication
Spain
Abstract
Avian tuberculosis is a chronic disease with worldwide distribution, caused by organisms belonging to the Mycobacterium avium complex (MAC). The aim of this study was the comparison of polymerase chain reaction (PCR) (16S rDNA PCR "multiplex") in liver samples with detection by the same technique in liver smears stained by Ziehl-Neelsen (ZN). One hundred and twenty canaries, 118 belonging to canaries (Serinus canarius) and 2 belonging to Diamante sparrow (Emblema guttata) with clinical suspicion of avian tuberculosis were analyzed through 40 pools of liver samples classified as positive or negative according to results of ZN. The agreement between both methods was assessed using Kappa of Choen (kappa) value that expressed the agreement beyond chance. Amplification was observed in 27 (67.5%) pools of tissues and in 12 (30.0%) stained smears. Combination of the two techniques classified 80% (32/40) as positive pools. The concordance of PCR in tissue smears with PCR in tissues for detection of MAC was negative (kappa = -0.096). The results of this study demonstrated that not all infected animals are detectable by the same technique and that the combination of tests could increase the detection rate and improve the diagnosis.
Publication Type
Journal article.

<15>
Accession Number
20143205916
Author
Baquiao, A. C.; Luna, J. O.; Medina, A. O.; Sanfilippo, L. F.; Faria, M. J. de; Santos, M. A. A. dos
Title
Optimized nested polymerase chain reaction for antemortem detection of Mycobacteria in Amazon parrots (Amazona aestiva) and orange-winged Amazons (Amazona amazonica).
Source
The objectives of this study were to optimize nested polymerase chain reaction (PCR) for Mycobacterium avium complex and Mycobacterium tuberculosis complex and apply them on samples from parrots. Results were negative for the presence of these Mycobacterium in the samples, and nested PCR was specific, faster, and more sensitive than other tests, thereby justifying its use in antemortem diagnosis.

Incidental Mycobacterium-induced granulomatous inflammation of the follicular pharyngeal tonsils in a South African farmed ostrich (Struthio camelus).

Avian mycobacteriosis (AM) is a zoonotic disease caused by Mycobacterium avium complex (MAC), which can spread from avians to other farmed animals such as cattle and pigs as well as to humans. This study is the first report of granulomatous inflammation, as a result of avian mycobacteriosis, in the follicular pharyngeal tonsils of a farmed ostrich. The head of an apparently healthy farmed adult ostrich was obtained after slaughter. Each pharyngeal fold displayed a large tissue mass. This tissue was routinely prepared for light microscopy and stained with haematoxylin and eosin, periodic acid Schiff, Grocott methenamine silver, Gram and Ziehl-Neelsen. Immunohistochemistry (IHC) and polymerase chain reaction (PCR) were performed to identify Mycobacterium spp. and Mycobacterium tuberculosis complex, respectively. Histologically, the tissue masses consisted of confluent mature micro-granulomata that were characterised by central caseous necrosis surrounded by multinucleated giant cells, macrophages and lymphoid cells and an outer mature fibrous connective tissue capsule. Within some foci of caseous necrosis were variably sized colonies of small, Gram-negative, acid-fast bacilli, which showed positive IHC labelling for Mycobacterium spp., leading to a presumptive diagnosis of AM. PCR thus proved useful in excluding the presence of notifiable Mycobacterium spp. The significance and role of the pharyngeal tonsils of ratites in diseases such as AM warrant specific attention. Moreover, as ratites are known to present with AM infections with apparently no visible loss in body condition, as presumably occurred in the present case, it is imperative that unusual masses in apparently healthy ratites be thoroughly investigated.
Accession Number
20143056902
Author
Mayahi, M.; Mosavari, N.; Esmaeilzadeh, S.; Asadollahi, K. P.
Title
Avian tuberculosis in naturally infected lofts of domestic pigeons, isolation, molecular identification and study of necropsy findings.
Source
Publisher
Veterinary Solutions LLC
Location of Publisher
Apopka
Country of Publication
USA
Abstract
The purpose of the present study was to investigate the occurrence of Mycobacterium avium subsp. avium in naturally infected lofts of domestic pigeons, clinical signs, necropsy findings, differential susceptibility of male and female pigeons to infection and disease and vertical transmission. Eighty out of more than 600 pigeons were selected based on their clinical signs and poor health conditions and under standard condition were euthanized, necropsied and followed by bacterial culture on specific media for MAA. Further 10 pigeon eggs, which were laid by these birds, were also individually cultured in search for Mycobacterium avium subsp. avium. Fifty one Mycobacterium avium subsp. avium isolated from pigeons and 1 from eggs. All acid fast basil isolate were tested by the PCR assays targeting the 16S rRNA, IS1245 and IS901 genes. Swollen joints in legs and wings consequent lameness and inability to fly were the most important clinical signs. In necropsy findings liver was the most affected organ which had lesion. The least affected organ was lung also no macroscopic necropsy lesion was found in the gonads, kidneys and CNS. Based on clinical and necropsy findings and isolation of acid fast bacteria, no significant difference between male and female pigeons in susceptibility to infection and disease was found. Based on necrospy findings four forms of disease manifestations were described, classic tuberculosis, intestinal form, liver form and non TB form. It was concluded that on the basis of frequency of clinical signs, necropsy lesions, isolation and identification of MAA from suspected pigeons, frequency of avian tuberculosis in the pigeons was high, but it needs further investigation, especially molecular epidemiology studies.
Publication Type
Journal article.

Accession Number
20143019089
Author
Kelly, P.; Jahns, H.; Power, E.; Bainbridge, J.; Kenny, K.; Corpa, J. M.; Cassidy, J. P.; Callanan, J. J.
Title
Mycobacteriosis in ostriches (Struthio camelus) due to infection with Mycobacterium bovis and Mycobacterium avium complex.
Source
Publisher
Abstract
Avian tuberculosis rarely affects ratites compared to other bird species and is typically caused by Mycobacterium avium species. This study describes the pathological and microbiological findings in three adult ostriches with mycobacteriosis, in one of which Mycobacterium bovis was isolated from the lesions. Post mortem examinations on ostriches from two different zoological collections in Ireland revealed multifocal caseous granulomas affecting the spleen and liver in all cases, with additional involvement of intestines in two cases. In one case, granulomas were present within the pharynx, at the thoracic inlet and multifocally on the pleural surface. Acid-fast bacilli were observed in all lesions. Mycobacterium sp. of the M. avium complex was isolated from the intestinal lesions in the two cases with intestinal involvement, and M. bovis sp. oligotype SB0140 was cultured from the liver of the third ostrich. This represents the first reported case of M. bovis infection in an ostrich. Avian tuberculosis due to M. bovis is rare and to date has been reported in only parrots and experimentally inoculated birds. Mycobacterium bovis needs to be considered as a possible cause of tuberculosis in ostriches because the lesions are similar to those observed with M. avium complex infection.