

Acute Septicaemic Pasteurellosis In a Domestic Duck: Diagnostic Approach Using Conventional and Molecular Methods

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Abstract

Pasteurellosis remains an important bacterial disease in both domestic and wild ducks. This report details a case of acute septicemic pasteurellosis in an eight-month-old backyard Pekin duck. The bird exhibited lethargy, nasal discharge, and diarrhoea before succumbing within two days. Gross changes included pulmonary congestion, epicardial haemorrhages, and multifocal hepatic necrosis. Microscopy of blood and liver smears revealed bipolar bacteria. Bacterial isolation and biochemical tests supported identification within the genus *Pasteurella*. Molecular detection through PCR targeting the *rpoB* gene further confirmed the organism. This case underscores the threat of pasteurellosis in small-scale duck production and stresses the value of prompt diagnosis and improved biosecurity.

Key words: *Pasteurella* spp., duck, septicaemia, PCR, diagnosis

Introduction

Pasteurellosis, primarily associated with *Pasteurella multocida*, is a significant infectious disease affecting domestic and wild waterfowl, including ducks. The disease is known for its acute course, rapid spread, and capacity to cause considerable economic losses in both intensive and backyard rearing systems (Christensen *et al.*, 2008). Susceptibility in ducks typically increases after the first month of life, and

outbreaks can occur abruptly, often leading to heavy losses within a short timeframe (Mbuthia *et al.*, 2008).

Members of the genus *Pasteurella* may exist harmlessly in the upper respiratory tract of apparently healthy birds but can become pathogenic when birds are stressed by factors such as crowding, poor sanitation, nutritional deficiency, or sudden climate changes (Jayathangaraj *et al.*, 2011). Affected ducks may show non-specific illness such as depression, anorexia, nasal discharge, diarrhoea, and respiratory distress. In peracute cases, sudden death without warning is common (Friend, 1999; Samuel *et al.*, 2007). Chronic infections, in contrast, present as localized lesions involving wattles, joints, or respiratory passages (Allam *et al.*, 2013).

Transmission occurs directly between birds or indirectly through contaminated feed, water, or inhalation of aerosols. Birds that recover may act as carriers, sustaining infection in flocks. Wild birds are recognized as important reservoirs, especially in open or backyard production systems (Bredy and Botzler, 1989).

The present study reports a case of acute pasteurellosis in a domestic duck, confirmed through clinical signs, post-mortem findings, bacterial isolation, biochemical characterization and molecular diagnostics. This case highlights the importance of early detection and improved biosecurity in preventing disease outbreaks in small-scale duck farming.

Materials and Methods

A female Pekin duck of 8 months age

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reared for backyard egg production was presented for post-mortem examination. Systematic post-mortem examination was performed and gross lesions were documented. Blood smears from the heart and impression smears from the liver were prepared, stained with Field's stain, and examined microscopically. Blood swabs were streaked onto 5% sheep blood agar and incubated at 37°C for 24 hours. Isolated colonies were subjected to standard biochemical identification tests including catalase, oxidase, indole, methyl red, Voges-Proskauer, citrate and urease tests following standard protocols. PCR amplification targeting the *rpoB* gene, specific for *Pasteurella* spp., was performed for molecular confirmation.

Results and Discussion

Pasteurella spp., including *P. multocida*, are recognized avian pathogens. While sometimes part of the normal respiratory flora, they may act as primary or secondary pathogens in poultry (Antony *et al.*, 2007). With the rapid expansion of global poultry production, control of pasteurellosis remains a major concern, particularly in ducks.

The occurrence of pasteurellosis in the 8-month-old backyard duck highlights the vulnerability of small-scale operations to infectious diseases. Free-range and backyard systems are at increased risk due to exposure to wild reservoirs and inadequate biosecurity. The absence of vaccination in this case further emphasizes the need for preventive measures.

Clinically, the duck exhibited a two-day history of lethargy, depression, anorexia, mild respiratory distress with mucoid nasal discharge, and greenish mucoid diarrhoea. Similar observations have been reported previously (De Alwis, 1992).

Gross examination revealed pulmonary congestion and consolidation (Fig. 1), mucosal

congestion of the trachea with mucoid exudate, petechial haemorrhages on the epicardium (Fig. 2), and hepatic congestion with pale necrotic foci (Fig. 3). Severe congestion of mesenteric vessels and blood-stained intestinal contents were also observed, aligning with prior reports (Abdel-Rahman *et al.*, 2009).

Microscopy of heart blood and liver impression smears demonstrated bipolar organisms characteristic of *Pasteurella* spp. (Fig. 4). On culture, dewdrop, non-hemolytic colonies developed on sheep blood agar (Fig. 5). Biochemical characterization showed an indole-positive, methyl red-negative, Voges-Proskauer-negative and citrate-negative reaction pattern (+ – – –), typical of *Pasteurella* spp. (Fig. 6), in agreement with Awad-Alla and Mahmoud (2011).

PCR targeting the *rpoB* gene yielded a 560 bp amplicon (Fig. 7), confirming the presence of *Pasteurella* spp., in line with Korczak *et al.* (2004). However, species-level identification was not undertaken in the present case.

Conclusions

This case confirms acute septicemic infection with *Pasteurella* spp. in a backyard duck, established through clinical, pathological, bacteriological, biochemical, and molecular findings. Lack of vaccination and poor biosecurity practices could have contributed to the disease occurrence. Strengthening preventive strategies, including improved hygiene, surveillance, and development of effective vaccines, is essential for protecting small-scale duck populations.

Conflict of Interest

The authors declare no conflict of interest.



Fig.1 Duck - Pasteurellosis – Lungs – Multifocal areas of congestion and consolidation



Fig.2 Duck - Pasteurellosis – Heart - Multifocal petechial haemorrhages on the epicardium



Fig.3 Duck – Pasteurellosis – Liver – locally extensive greyish foci

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