

# GENOTYPIC CHARACTERIZATION OF *Escherichia coli* ISOLATED FROM INFECTED CHICKEN IN BASRAH, IRAQ

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Supporting Information

**ABSTRACT:** This study aimed to detect the presence of *Escherichia coli* in broiler and layer hens in the Basrah province, Iraq using macroscopic and microscopic diagnosis and bacterial isolation that causes infection in some internal organs (liver and heart), and by polymerase chain reaction. Randomly chosen samples were taken from different places within Basrah province for further investigation (poultry fields in Al-Qurnah and Al-Hartha). The bacteriological analysis revealed that the presence of *Escherichia coli* is responsible for causing fibrinous pericarditis and perihepatitis in birds. The macroscopic examination revealed hemorrhagic lesions and a significant buildup consisting of a white fibrous accumulation in the pericardial sac of the infected birds' hearts. The livers of infected birds exhibited significant deposition of white fibrous exudate on the liver surface, along with hepatomegaly. The afflicted heart displays a microscopic appearance marked by a notable aggregation of inflammatory cells in the pericardial sac and the release of fibrinous exudate. Additionally, there is an accumulation of edematous exudate in the cardiac muscle fibers, accompanied with congestion of blood vessels in the myocardium. The microscopic examination of the infected liver revealed the existence of a significant infiltration of inflammatory cells in the liver capsule, as well as the presence of a thick fibrinous exudate encapsulated on the liver surface and congestion of the central vein. The histological analysis of the affected heart and liver revealed a significant buildup of collagen and fibrin fibers, which exhibit a prominent dark bluish staining. This buildup is widely distinguished in the pericardial and hepatic capsules. The study indicated that fibrinous pericarditis and perihepatitis affected birds, as indicated by the examination of bacterial results. *Escherichia coli* emits endotoxins that induce vascular damage in the heart and liver, resulting in an elevated presence of fibrin exudate around the affected tissue. The histological analysis supported this conclusion.

**Keywords:** Fibrinous, Pericarditis, Perihepatitis, Pathology, Biological.

## INTRODUCTION

Fibrinous pericarditis is inflammation of the pericardium that is accompanied by hyperemia and the deposit of fibrin within the pericardial sac (Perkins et al., 2004). Fibrinous perihepatitis is inflammation of the hepatic capsule by the accumulation of large amounts of There is a layer of fibrinous exudate covering the liver's surface. consisting of heterophils and lymphocytes (Bhalerao et al., 2013).

Fibrinous pericarditis and perihepatitis in poultry associated with colibacillosis and mycoplasmosis cause Issues pertaining to the economy and well-being of chickens. The frequent incidence of this phenomenon had detrimental impacts on both growth and health status. Termed airsacculitis or chronic respiratory disease in medical terminology, this condition leads to respiratory discomfort, stunted growth, reduced food consumption, and an increased mortality rate. *Escherichia coli* infections are often concurrent and result in exudative accumulations, adhesive fibrinous pericarditis, and fibrinous perihepatitis (Vandemaele et al., 2002).

Pneumonia and airsacculitis may eventually allow for vascular system entry. The primary source of systemic colibacillosis or colisepticemia is thought to be this aerogenic route of infection (Dho-Moulin and Fairbrother, 1999). Colisepticemia is characterized by *E. coli* in the circulation (Pourbakhsh et al., 1997). Airsacculitis, a respiratory infection that first develops in colisepticemia, is followed by a widespread infection that includes perihepatitis and pericarditis (Mellata et al., 2003).

Avian pathogenic *Escherichia coli* causes a variety of systemic or localized infections, including colisepticemia (fibrinous exudates being present in several organs), respiratory infections, airsacculitis, swollen head syndrome, peritonitis, salpingitis, yolk sack infections in newly hatched chicks, and skin infections (Nolan et al. 2013). *Escherichia coli* infections frequently occur concurrently and produce exudative accumulations, sticky pericarditis, and fibrinous perihepatitis in addition to significant air sac thickening and turbidity (Nolan et al., 2013).

Physical and biological risk factors that significantly increase the likelihood of colibacillosis in chickens include housing conditions and co-infections with other bacteria. Most diseases spread through aerosols and colonize air sacs (Lamarche et al., 2005). Dust and ammonia work together to produce harmful consequences, and the inhalation of dust

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