



A Field Study on Infectious Bronchitis Virus in Broiler Chickens in Southern Iraq

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ABSTRACT

Infectious bronchitis virus (IBV) is a highly transmissible avian Gamma-coronavirus that continues to pose a major challenge to poultry health and productivity worldwide, particularly in broiler production systems. The present investigation aimed to detect and characterize IBV infections in broiler flocks located in two districts of Southern Iraq between late 2024 and early 2025. A total of 200 clinically affected broilers (100 broilers from each flock) were sampled, with tracheal and kidney tissues collected for clinical evaluation, histopathological assessment, and viral isolation. Suspected IBV-infected chickens showed respiratory distress, increased mortality, and kidney lesions. The suggestive post-mortem lesions were caseous plug exudates at the tracheal bifurcation, as well as congested and hyperemic kidneys. The inoculation of tracheal and kidney tissue suspension in embryonated chicken eggs (ECEs) resulted in death, stunting, curling, dwarfism, congestion, and subcutaneous hemorrhages. The histopathological findings in tracheal tissues revealed epithelial desquamation, goblet cell depletion, and lymphocytic infiltration, while kidney findings exhibited tubular degeneration, glomerular disruption, and fibrin deposition. These findings emphasize the need for future studies to focus on the molecular identification of circulating strains, vaccine matching, and monitoring of post-vaccination protection levels in Iraq.

Keywords: Broiler chicken, Histopathology, Infectious bronchitis virus, Isolation, Kidney, Trachea

INTRODUCTION

The major difficulties threatening poultry production worldwide are viral diseases. Globally, infectious bronchitis (IB) is considered the second most economically damaging viral disease affecting the poultry sector, following the highly pathogenic avian influenza (De Wit and Cook, 2019). Infectious bronchitis is responsible for substantial economic losses to the poultry industry, particularly in broiler flocks where it reduces weight gain, feed efficiency, and survival rates. Losses may range from \$0.03 to \$0.10 per broiler, depending on strain virulence and flock age (Jackwood and de Wit, 2020; Rafique et al., 2024).

As reported by the International Committee on Taxonomy of Viruses (ICTV, 2024), the infectious bronchitis virus (IBV) belongs to the genus *Gamma-coronavirus*, subgenus *Igacovirus*, within the subfamily *Orthocoronavirinae* of the family *Coronaviridae*. The

virus possesses a pleomorphic, enveloped structure and contains a positive-sense, single-stranded, non-segmented RNA genome of approximately 27.6 kb. This genome encodes both non-structural proteins and the major structural proteins, namely the nucleocapsid (N), membrane (M), envelope (E), and spike (S) proteins (Dimitrov et al., 2019; Quinteros et al., 2022).

The IBV is commonly considered a respiratory pathogen that replicates in the tracheal mucosa (Amarasinghe et al., 2018), while some strains of the virus show broad tissue tropism to kidneys, reproductive tract, bursa of Fabricius, gastrointestinal tract (proventriculus and cecal tonsils), and spleen (Rafique et al., 2024). In laying hens, variant strains of IBV may cause damage to the reproductive tract (Cook et al., 2012; Ramsubeik et al., 2023). This broad tissue tropism emphasizes the complexity of IBV pathogenesis (Bande et al., 2016; Rafique et al., 2024).