جمهورية العراق
وزارة التعليم العالي
والبحث العلمي
جامعة ديالى
كلية الطب البيطري
فرع الاحياء المجهرية

الكشف الجزيئي عن فيروسي كل من مرض التهاب جراب فابريشيا وفقر الدم المعدي في فروج اللحم في محافظة ديالى

رسالة مقدمة الى

كلية الطب البيطري جامعة ديالى وهي جزء من متطلبات نيل درجة الماجستير في الاحياء المجهرية البيطرية

قدمتها

ايناس طه خلف

باشراف

ا.د عامر خزعل صالح

ا.د كريم سعدون علي

2021م ١٤٤٢ ه

INTRODUCTION

Infectious bursal disease (IBD) is caused by a virus belonging to the *Avibirnavirus* genus of an RNA family *Birnaviridae* (Leong *et al.*, 2000). The disease occurred for the first time in the flock of broilers in Sussex , USA. It was also named (Gumboro) due to an outbreak of the disease recorded in Gumboro, Delaware , USA. It causes a characteristic lesion in infected avian kidneys, and so named (avian nephrosis) (Rauf *et al*., 2011; Dey *et al*., 2019). The name of the disease as IBD was attributed to the isolation of the viral pathogen from bursa of fabricious (Cosgrove *et al.*, 1962).

Gumboro or IBD is a highly infectious and sever disease in young chicken of three to six weeks of age. Infected birds with the virus showed swollen bursa and destruction of bursal lymphocytes that resulted in severe immunosuppression of the defense system, the birds were highly depressed with trembling prostration. Furthermore, the infected birds showed dropping of white watery fluids and accumulation of urate in kidneys and urinary tubules with high mortality rates in acute disease conditions. Subclinical disease conditions were observed in birds less than three weeks of age, whereas the muscles of infected birds showed dehydration especially in those above three weeks of age (Lukert and Saif, 2003; Hair-Bejo *et al.*, 2004; Ingraor *et al.*, 2013).

The disease was worldwide in distribution and known to affect chickens, whereas asymptomatic infections are noticed in other susceptible birds like ostriches, guinea fowl turkeys, and ducks (Sharma *et al*., 2000; Teshome *et al.*, 2015).

Many studies showed the presence of two serotypes of IBDV; serotypes 1 and 2. Serotype 1 was considered as the main serotype that is distributed worldwide causing serious clinical disease, Accordingly all vaccines were prepared from such serotype (Teshome *et al.,* 2015). The disease caused economic losses in the poultry industry and it was endemic worldwide (Dye *et al.,* 2019).

Chicken anemia virus (CAV) is another viral disease affecting chicken and distributed worldwide. The virus was isolated from diseased chicken in Japan in 1979 (Yuasa *et al.,* 1979), whereas it was circulated among chicken in the USA since 1959 (Zahang *et al.,* 2013). The disease caused transient plastic anemia and immunodeficiency in young infected birds as it infects the cells of bone marrow (hematocytoblasts), immature and mature T lymphocytes of the thymus, and secondary lymphoid organs (Adair, 2000; Li *et al.,* 2017).

The virus pathogen of CAV is a single-stranded and circular negative sense DNA virus that is too small and classified within the genus *Gyrovirus* of the *Anelloviridae* family (Rosario et al.,2017).

The CAV disease is infectious and contagious affecting chicken of two to four weeks old causing immunosuppression and severe anemia associated with lymphoid atrophy and high mortality in young birds (Dhama *et al.,* 2008; Oluwayelu, 2010). It is one of the main threats affecting the poultry industry especially in the presence of outbreaks associated with secondary pathogens due to immunosuppression caused by the CAV. The disease was characterized by hypoplasia or atrophy of lymphoid organs, pale mucous membrane, hemorrhages in cutaneous and subcutaneous tissues observed in the skin of wings (Blue wing disease) or

different parts of the body. Mortality rates varied from 2 to 10% or more if secondary infection with other pathogens was present, but the recovery of surviving birds may require 20 to 28 days post-infection (Schat and Van Santen, 2020).

Both modes of vertical and horizontal transmission of CAV were reported. Vertical transmission occurred through the hatched eggs of breeder hens asymptomatically infected, or horizontally by the fecal-oral route, inhalation, and contaminated fomites (Cardona *et al.*, 2000).

The severity of CAV was found to be associated with coinfection with many other viruses like IBDV (Miles *et al.*, 2001). Age resistance to the infection with CAV or its persistence in blood cells was associated with IBDV infection. The duration of CAV virus shedding has increased by infected chicken at six weeks of age in the presence of IBDV coinfection this was reported for the first time in 1980 (Cloud *et al.*, 1992).

These Results could be explained by the fact that IBDV infection prevents the generation of antibodies against CAV. Infectious bursal disease and chicken anemia virus exhibit a wide range of pathogenicity and severity in most Diyala flocks, Accordingly,evaluation of the pathogenicity of IBD and CAV is required in order to contain outbreaks and reduce their effects (Toro *et al.*, 2009).

So the present study is an objective to Conducting :

1- Serological identification of IBDV and CAV in some flocks of broiler chicken in Diyala Province that were exposed to both viruses.

2- Molecular characterization of IBDV and CAV in some flocks of broilerchicken in Diyala Province.

3- Phylogenetic analysis of identified strain of IBDV and CAV of broiler chicken in Diyala to point out the relatedness of Diyala identified strains to reference strains from NCBI (GenBank).