

## Detection of antibodies against avian infectious laryngeotracheitis virus in Iraq

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### Abstract

The study is concerned with detection of infectious laryngeotracheitis virus antibodies in Iraq. One hundred sera samples were collected from chickens with respiratory infection from different areas in Iraq (Diala, Kut, Suwayrah, Hilla, Diwaniyah, Samawah and Najaf), enzyme linked immunosorbent assay (ELISA) test was conducted for collection sera samples. ELISA test was positive for 24 samples out of 100 samples collected from different areas in Iraq with a percentage of 24%. Collected sera of chickens with age (5-6) weeks produced negative result with ELISA test. Nineteen collected sera out of sixty three samples of chickens with age (10-20) weeks were positive with ELISA test. Five sera samples out of twenty seven samples of chickens with age (22-51) weeks were positive with ELISA test.

**Keywords:** infectious laryngeotracheitis virus, detection, antibodies.

### التحري المصلي لاضداد فايروس التهاب الحنجرة والرغامى المعدى الطيري في العراق

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### الخلاصة

عنيت هذه الدراسة بالتحري عن الاجسام المناعية لفايروس التهاب الحنجرة والرغامى الطيري في العراق. تم جمع مائة عينة من مصل دجاج مصاب بأعراض تنفسية من مختلف مناطق العراق (ديالى، الحلة، الصويرة، الكوت، الديوانية، السماوة والنجف) إذ أجريت تقنية الإنزيم المناعي الممتز لعينات المصل التي تم جمعها. أظهرت تقنية الإنزيم المناعي الممتز نتائج موجبة لأربعة وعشرين عينة مصل من اصل 100 عينة تم جمعها من مختلف مناطق العراق وبنسبة 24%. العينات المصلية التي تم جمعها لدجاج بعمر (5-6) أسابيع كانت سالبة بفحص الإنزيم المناعي الممتز. تسعة عشر عينة من اصل ثلاث وستين عينة مصلية لدجاج بعمر (10-20) أسبوع كانت موجبة بفحص الإنزيم المناعي الممتز. وخمسة عينات من اصل سبعة وعشرين عينة مصلية لدجاج بعمر (22-51) اسبوع كانت موجبة بفحص الإنزيم المناعي الممتز.

**الكلمات المفتاحية:** فايروس التهاب الحنجرة والرغامى، التشخيص، الأجسام المناعية.

### Introduction

Avian infectious laryngotracheitis (ILT) is an acute contagious disease of chickens that affect upper-respiratory tract, ILT was detected in the USA for the first time in 1925 (1). The clinical manifestation of the disease are nasal discharge, conjunctivitis, gasping, coughing, reduced egg production, and expectoration of bloody mucus with marked dyspnea that may cause suffocation (2). ILT is responsible for worldwide economic losses in industries of poultry (2). Peracute form spread suddenly with high morbidity and mortality may exceed 70% (3), subacute form shows high morbidity but lower mortality than peracute form between 10-30% (4). Chronic and mild forms seen

among surviving above forms or as an outbreak with low morbidity and mortality (4). Infectious laryngotracheitis (ILT) is belong to the family of *Herpesviridae*, the genus of *Iltovirus* and species of *Gallid herpesvirus 1* (5). DNA virus has icosahedral morphology similar to herpes simplex virus (6). ILTV has hexagonal nucleocapsid with 80-100 nm in diameter; the nucleocapsid is icosahedral in symmetry and has 162 elongated hollow capsomeres (6). Infectious laryngotracheitis virus-specific antibodies can be used for serological diagnosis by virus neutralization, agar-gel immunodiffusion, indirect immunofluorescence, and enzyme linked immunosorbent assays (ELISA) (1). The ELISA technique has also been used for detection of viral proteins in tracheal exudates (7). This study aimed to detect specific antibodies against avian infectious laryngotracheitis virus in different areas of Iraq by using ELISA test.

### Materials and Methods

- **Collection of samples:** One hundred (100) blood samples were collected directly from the heart or wing vein of chickens suffering from respiratory tract infection (Broiler, layer, breeder) from different areas of Iraq with age varied from (5- 51) weeks (table 1). Serum samples were collected in test tubes and preserved at -20 C° till used.
- ELISA kits (ProFlock®) for the detection of Infectious laryngotracheitis antibodies in serum imported from Synbiotics Corporation\U.S.A.
- ELISA test for detection of ILT antibodies in the serum. Sera were collected from chickens suffering from respiratory distress were examined by ELISA test kit as instructions of manufacturer Company.

### Results

- **Result of ELISA test:** It was showed that 24 samples out of 100 samples were positive 24% with titer approximately range from (350-7806) (table 2) with mean (1239.25) and stander error (S.E) (379.84) (9).

**Table (1) explain correlation between age of chickens and result of ELISA test**

Breeds	No. of samples	Positive/negative Results	Age/weeks	Areas
breeder	27	5/22	22-51	Diala, Kut
Layer	63	19/44	10-20	Suwayrah, Hilla, Al-Diwaniyah, Samawah
Broiler	10	0/10	5-6	Najaf, Hilla

**Table (2) Detection of ILT antibodies virus by ELISA test**

Sample No.	Titer	Sample No.	Titer	Sample No.	Titer
1	405	10	362	19	983
2	526	11	418	20	3795
3	387	12	490	21	973
4	503	13	356	22	380
5	356	14	368	23	2584
6	802	15	350	24	375
7	531	16	1456		Mean±1239.25
8	376	17	7806		
9	771	18	5358		S.E.379.84

Samples number relation to farms taken from \*Breeder: Diala farm (1, 2), Kut farm (13, 14, 15), \*\* layer: Suwayrah farm (3, 4, 5, 6, 7, 8), Samawah farm (9), Diwaniyah farm (10, 11, 12, 24), Hilla farm (16, 17, 18, 19, 20, 21, 22, 23).

## Discussion

Avian infectious laryngotracheitis is acute respiratory disease affecting chickens caused by *herpesvirus* (9). Several serological tests have been described for detection of ILT antibodies. The classical method for diagnosis of ILT virus is serum neutralization (SN) test embryonated eggs use for titration of virus-serum mixtures, adding to the time and cost involved (10). The agar gel immunodiffusion (AGID) test is still widely used but is relatively insensitive according to (11). In this study ELISA test was used for detection of antibodies against ILT virus, ELISA test was shown to be highly sensitive in detection of ILT antibodies (12). Serum samples of chickens at age range from (10-22) weeks old layer and breeders gave positive results by using ELISA test and that is the most susceptible age for infection with ILT virus this agreed with (12) who confirm the same result; while broiler chickens aged from (5-6) weeks gave negative result mostly due to its age (13). Antibodies titer showed a wide range of variability (table 2) this explains different stages of infection; lower titer related to chronic infection while higher ones related to acute or subacute infection (14). Conclusions, ELISA test was dependable and can be used widely to detect ILT virus antibodies, According to this study the highest Ab level is within the age of (10-20) weeks, this might be due to acquired immunity as a result of vaccination at early age or early infection, The study recommend to compare further serological test rather than ELISA as AGID to confirm the most sensitive one in detecting Ab related to ILT virus, Positive Ab is indicative for either previous vaccination or previous infection and the birds are carrier. For this reason comprehensive efforts should be adapted to prove that, Performing another study to detect specific antibodies of ILT virus in more than ten governorates of Iraq and in different ages of chickens.

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