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Research Article
Study on Seroprevalence of various diseases in EMU in Gujarat

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Keywords

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HI,
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Abstract

Aim: This study was undertaken to study the seroprevalence of various diseases in emu birds in Gujarat region. **Material & Method:** Serum was separated from blood collected from right jugular vein in serum accelerator tubes from 55 emu birds of various farms in Gujarat and processed further for serological examination.Stored serum samples were submitted to Hester Biosciences Ltd., Ahmedabad for estimations of titre values of Newcastle disease virus and Low pathogenic avian influenza H9N2 virus by HI test and infectious bronchitis virus by ELISA. **Result:** Out of total 55 samples 40 were positive for antibodies against Newcastle disease virus and and 48 were positive for antibodies against LPAI virus respectively and none supported presence of antibodies for Infectious Bronchitis virus. **Conclusion:** The present study reveals that Emu is infected by several viruses like Eastern Equine Encephalitis, Avian influenza, New castle disease, Infectious Bronchitis and Pox infection, out of which New castle disease and avian influenza is serologically prevalent in the emus of Gujarat region.

Introduction

Emu (*Dromaius novaehollandiae*) is the second largest bird native to Australia and the only extant member of the genus Dromaius.The emu was long classified with its closest relatives, the cassowaries, in the family Casuariidae, part of the ratite order Struthioniformes, but an alternate classification has been recently adopted which splits the Casuariidae into their own order, Casuariformes (Tudge C, 2009).Emu is considered as one of the latest emerging species in Indian poultry diversification. Emus are reared primarily for their meat, leather and oil. Emu meat is a low-fat meat (less than 1.5% fats) and with low cholesterol (85 mg/100 gm) comparable to other lean meats.

Recently, commercial farming of emu has gained importance in India. NRI at West Godavari district in Andhra Pradesh started emu farming for the first time during 1996. Later on, breeding flocks were spread throughout the country for the commercial purpose. Presently, emu farming is being carried out in large scale in States of Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu, Karnataka, Orissa, Kerala and some parts of Northern India. There are more than 5000 emu farms in India at present, with capacities ranging from 4 to 10,000 birds, with a total population of 2,50,000 birds (Narahari et al. 2008). Today emus are transitioning from a breeder industry to a commercial industry.Emu farming has expanded worldwide but little is known on the health status of emu in India. In this context, the surveillance and control of some avian pathogens are essential for the success of the emu industry.

Therefore, the study was undertaken to know the prevalence of antibodies against Newcastle Disease virus, Low pathogenic avian influenza virus and Infectious bronchitis virus in serum samples collected from commercial emu farms in Gujarat.

Materials and Methods

Serological study: 3-4 ml of blood was collected from right jugular vein in serum accelerator tubes from 55 emu birds of

various farms in Gujarat. Serum was separated and stored at -20 degree Celsius till further processing.Stored serum samples were submitted to Hester Biosciences Ltd., Ahmedabad for estimations of titre values of Newcastle disease virus and Low pathogenic avian influenza H9N2 virus by HI test and infectious bronchitis virus by ELISA.

Results

Out of total 55 samples 40 and 48 were positive for antibodies against Newcastle disease virus and LPAI virus respectively. A total of 32 (58 %) samples were positive by using HI considering ≥ 1:16 as cut off titre for antibodies against Newcastle disease virus. 44 (80 %) samples were positive by HI test using ≥ 1:32 as cut off titre for antibodies against LPAI virus. Detail results are presented in Table [1]. Titre against infectious bronchitis virus was evaluated using ELISA as per manufacturer's instructions. All the samples were negative for antibodies against IB virus.

Table1: Detail of serotitre (ND & LPAI) results along with farms.

Sample No.	Name of the Farm	Detail of Birds	Total Birds	Nd Titre	LPAI Titre
1	Kamala Emu Farm, Bedva	9 months	10	---	1 : 32
2				1 : 8	1 : 32
3				---	1 : 32
4				---	1 : 64
5				---	1 : 64
6	Sarsa Emu Farm, Sarsa	1 year	30	1 : 64	1 : 64
7				1 : 16	1 : 512
8				1 : 4	1 : 32
9				1 : 16	1 : 32
10				---	1 : 32
11				1 : 8	1 : 128
12				1 : 8	1 : 128
13				1 : 8	1 : 64
14				---	---
15					1 : 64
16	Emu Farm,Ratanpura	9 months	53	1 : 64	1 : 256
17				1 : 16	1 : 256
18				1 : 64	1 : 128
19				1 : 16	1 : 32
20				1 : 64	1 : 64
21				1 : 16	1 : 32
22				1 : 32	1 : 256
23				1 : 32	1 : 64
24				1 : 8	1 : 32
25				---	1 : 32
26	Emu Farm,Samarkha	1 year	20	1 : 512	---
27				1 : 32	1 : 32
28				1 : 32	1 : 512
29				1 : 32	1 : 8
30				1 : 64	1 : 8
31				1 : 64	1 : 2048
32				1 : 128	1 : 512
33				1 : 32	1 : 32
34				1 : 128	
35				1 : 16	1 : 32
36	Ankit Emu Farm, Nisraya	1 year	26	---	---
37					1 : 32
38				1 : 16	1 : 32
39				---	---
40				---	---

41				1 : 32	1 : 64
42				1 : 32	1 : 32
43				1 : 8	1 : 128
44					1 : 64
45					1 : 64
46	Sakil Emu Farm, Vasna	5 years	110	1 : 16	1 : 128
47				1 : 32	1 : 16
48				1 : 64	
49				1 : 32	1 : 16
50				1 : 64	1 : 64
51				---	---
52				1 : 8	
53				1 : 128	1 : 128
54				1 : 16	1 : 128
55				1 : 64	1 : 128

Discussion

New castle disease is common in emu birds and has already been reported by many scientists as cause of death.Srilatha et al. (2012) carried out 18 postmortems in emu birds during 2008 to 2011and diagnosed Newcastle disease in six cases. Our study showed 40 samples positive for New castle disease out of 55 samples providing 73% seroprevalence.Woolcock et al.(2000) tested serum of emu chicks for antibodies to avian paramyxovirus (APMV) types 1, 2 and 3 by hemagglutination-inhibition (HI) test and avian influenza virus by agar gel immunodiffusion (AGID) with reagents from National Veterinary Services Laboratories (NVSL), Ames. The serum at 1:4 dilutions was negative for APMV types 1, 2, and 3 by HI tests.Kumanan et al.(2003) collected spleen sample from dead emu birds. They conducted HA and HI test after propagating the virus in the egg embryo. They performed virus neutralization test and ICPI index. Isolates had ICPI of 1.83 and a MDT of 48 hrs. They further isolated the RNA and preceded it for phylogenetic study and found isolated strains related with mesogenic roakin strain.

Similar study was carried out byShinde et al.(2012) who studied surveillance in Maharashtra during 2010–2011. A total of 202 blood samples and 467 tracheal and cloacal swabs were collected from eight emu farms. They carried out hemagglutination inhibition (HI) assay for detection of antibodies against AI H5N1, H7N1, H9N2 and avian paramyxovirus type 1 (APMV-1) viruses. A total of 28.2% of samples were positive for antibodies against AI H9N2 by HI using ≥1:40 as a cut-off titre and 15.3% samples were positive for APMV-1 by HI assay using a ≥1:10 cut-off titre. Seropositivity of AI H9N2 was nil in the grower (<1 year) and highest (78%) in the breeder (2–3 year), whereas seropositivity against APMV-1 was observed in all age groups.Kang *et al.* (2006) reported isolation of low pathogenic avian influenza virus (LPAIV) from emu in China similar to the experiment in gujarat in which 48 cases were found positive for antibodies against Avian influenza in emu birds out of 55 cases. Laura et al. (2002) studied pathogenicity of H5N1 type A influenza viruses by intranasal (i.n.) inoculation of A/chicken/Hong Kong/220/97 (H5N1) highly pathogenic avian influenza virus and reported no mortality within 10 days post inoculation in the species investigated.The present study reveals that Low PathogenicAvian influenza and New castle disease is prevalent in the emus of Gujarat region.

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