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## *LIST OF ABBREVIATIONS*

Agar gel precipitin	AGP
Chlamydia psittaci	C.psittaci
Chlamydia trachomatis	C.trachomatis
Complement fixation	C.F.
Complement fixation test	C.F.T.
Cytopathic effect	CPE
Haemagglutination	HA
Haemagglutination inhibition	HI
Infectious bovine rhinotracheitis	IBR
Median Derby Bovine Kidney	MDBK
Parainfluenza-3 virus	PI-3
Phosphate buffered solution	PBS
Red blood cells	RBCs
Veronal buffer	VB

## ***SUMMARY***

In this investigation, a total number of 265 wild animals from different zoos "Giza, Alexandria and El-Mansoura zoos" were examined. Of these animals 32 wild animals were diarrhoeic, 18 showing respiratory signs, 6 showing pneumoenteritis and 209 animals were apparently healthy.

The prevalence of infection in different zoos was 142 out of 265 wild ungulates (53.58%). 30 out of 125 animals (24%) were infected with Parainfluenza-3 virus (PI-3); 22 out of 125 animals (17.6%) with Infectious bovine rhinotracheitis virus (IBR); 43 out of 265 animals (16.32%) with Adenovirus and 47 out of 265 animals (17.74%) with Chlamydia as well as 6 cases showed mixed infection.

The clinical manifestations associated with the infection by PI-3 virus include nasal discharge, cough and keratoconjunctivitis, but in IBR it include diarrhoea, nasal discharge, cough and keratoconjunctivitis. Signs on Adenovirus and Chlamydia include diarrhoea, which vary from soft faeces to severe watery diarrhoea with or without mucous, nasal discharge, cough and keratoconjunctivitis.

Most of infection in wild animals with PI-3 virus, IBR virus, Adenovirus and Chlamydia found to be in subclinical form where animals excrete organisms in their excretions, without any clinical signs.

PI-3 virus antigen were detected using Haemagglutination test (HA) and Haemagglutination inhibition test (HI).

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PI-3 virus were detected in Egyptian deer 3 out of 10, Fallow deer 1 out of 6, Sambar deer 1 out of 6, Ariels 1 out of 5, Bactrian camel 2 out of 10, Giraffe 1 out of 3, Nilgai 1 out of 5, Sable antelope 1 out of 1, Scimitar horned oryx 2 out of 7, Addax 1 out of 2, Black buck 1 out of 7, Ibex 4 out of 15, Arawi sheep 8 out of 36, Deffosa water buck 1 out of 3, Red lechwe 1 out of 2 and Beisa oryx 1 out of 2. Llama, Eland and Besia breaded gnu showed negative results.

In Giza zoo, 21 out of 95 animals (22.105%) were infected by PI-3 virus. The prevalence of infection in different animals were. Egyptian deer 2 out of 9, Fallow deer 1 out of 6, Sambar deer 1 out of 6, Ariels 1 out of 4, Bactrian camel 1 out of 6, Giraffe 1 out of 2, Nilgai 1 out of 4, Sable antelope 1 out of 1, Scimitar horned oryx 1 out of 5, Addax 1 out of 2, Black buck 1 out of 7, Ibex 2 out of 8, Arawi sheep 5 out of 26, Deffosa water buck 1 out of 3 and Beisa oryx 1 out of 2. But in Llama, Eland and White bearded gnu no positive results were obtained.

In Alexandria zoo, 7 out of 23 animals (30.43%) were give positive to PI-3 virus. The prevalence of infection in different animals were, Bactrian camel 1 out of 3, Scimitar horned oryx 1 out of 2, Ibex 2 out of 7 and Arawi sheep 2 out of 6. But in Ariels, Giraffe and Nilgai no positive results were obtained.

In El-Mansoura zoo, 2 out of 7 animals (28.57%) were give positive results to PI-3 virus. The prevalence of infection in Egyptian deer 1 out of 1 and Arawi sheep 1 out of 4. But in Bactrain camel and Llama no positive results were obtained.

PI-3 virus isolated and propagated using MDBK cells.

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Concerning with IBR virus was isolated and propagated by Agar gel precipitin test from 22 out of 125 (17.6%) wild ungulates.

The prevalence of infection in different animals species were, Egyptian deer 2 out of 10, Fallow deer 1 out of 6, Sambar deer 1 out of 6, Ariels 1 out of 5, Bactrian camel 2 out of 10, Llama 1 out of 2, Giraffe 1 out of 3, Nilgai 1 out of 5, Scimitar horned oryx 1 out of 7, Ibex 3 out of 15, Arawi sheep 7 out of 36 and Deffosa water buck 1 out of 3. But in Eland, Addax, Black buck, Red lechwe, White bearded gnu and Beisa oryx were negative to infection.

In Giza zoo, 17 out of 95 wild animals (17.89%) were give positive results to IBR virus. The prevalence of infection in different animals were, Egyptian deer 2 out of 9, Fallow deer 1 out of 6, Sambar deer 1 out of 6, Ariels 1 out of 4, Bactrian camel 1 out of 6, Llama 1 out of 1, Giraffe 1 out of 2, Nilgai 1 out of 4, Scimitar horned oryx 1 out of 5, Ibex 2 out of 8, Arawi sheep 4 out of 26 and Deffosa water buck 1 out of 3. But in Eland, Sable Antelope, Addax, Black buck, white breaded gnu and Beisa oryx no positive results were obtained.

In Alexandria zoo, 4 out of 23 animals (30.43%) were positive to IBR virus. The prevalence of infection in different animals were, Bactrian camel 1 out of 3, Ibex 1 out of 7 and Arawi sheep 2 out of 6. But in Ariels, Giraffe, Nilgai, Scimitar horned oryx and Red lechwe no positive results were obtained.

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In El-Mansoura zoo, 1 out of 7 animals (14.285%) were positive to IBR virus. The prevalence of infection in Arawi sheep 1 out of 4. But in other animals no positive results were obtained.

43 out of 265 animals (16.22%) were infected by Adenovirus. Antigen were detected using CFT at a titer of [1/2 "1", 1/8 "6", 1/16 "10", 1/32 "10" and 1/64 "16"].

The prevalence of adenovirus infection in different wild ungulates in different zoos were; Egyptian deer 3 out of 18, Fallow deer 1 out of 14, Sambar deer 3 out of 13, Ariels 1 out of 10, Bactrian camel 4 out of 17, Llama 1 out of 3, Nilgai 3 out of 8, Scimitar horned oryx 2 out of 13, Black buck 3 out of 7, Ibex 5 out of 32, Arawi sheep 15 out of 107, Deffosa water buck 1 out of 5 and Red lechwe 1 out of 4. But in Giraffe, Eland, Sable antelope, Addax, White Bearded Gnu and Besia oryx no infections were recorded.

In Giza zoo, 30 out of 201 wild animals (14.925%) were give positive results to Adenovirus. The prevalence of infection in different animals were, Egyptian deer 2 out of 17, Fallow deer 1 out of 14. Sambar deer 3 out of 13, Ariels 1 out of 7, Bactrian camel 2 out of 13. Llama 1 out of 2, Nilgai 2 out of 7, Scimitar horned oryx 2 out of 10. Black buck 3 out of 7, Ibex 3 out of 16, Arawi sheep 9 out of 77 and Deffasa water buck 1 out of 5. But in Giraffe, Eland, Sable antelope, Adax, White bearded gnu and Beisa oryx no results were obtained.

In Alexandria zoo, 9 out of 53 animals (16.98%) were infected by Adenovirus. The prevalence of infection in different animals were Bactrian camel 1 out of 3, Nilgai 1 out of 1, Ibex 2 out of 16, Arawi

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sheep 4 out of 22 and Red lechwe 1 out of 4. But in Ariels, Giraffe and Scimitar horned oryx no positive results were obtained.

In El-Mansoura zoo, 4 out of 11 animals "36.36%" were positive to Adenovirus. The prevalence of infection in different animals were, Egyptian deer 1 out of 1, Bactrian camel 1 out of 1 and Arawi sheep 2 out of 8. But in Llama no positive results were obtained.

Adenovirus were isolated and propagated in MDBK cells.

Chlamydia were recorded in 47 out of 265 wild ungulates (17.73%) using CFT in titre of [1/8 "5", 1/16 "11", 1/32 "12 and 1/64 "19"]. The prevalence of Chlamydia in different animals were Egyptian deer 4 out of 18, Fallow deer 2 out of 14, Sambar deer 2 out of 13, Ariels, 1 out of 10, Bactrian camel 3 out of 17, Giraffe 1 out of 3, Nilgai 2 out of 8, Scimitar horned oryx 3 out of 13, Addx 1 out of 4, Black buck 2 out of 7, Ibex 6 out of 32, Arawi sheep 18 out of 107, Deffosa water buck 1 out of 5 and White bearded gnu 1 out of 3. Llama, Eland, Sable antelope, Red lechwe and Beisa oryx were negative for Chlamydia.

In Giza zoo, 35 out of 201 animals "17.41%" were positive to Chlamydia. The prevalence of infection in different animals were, Egyptian deer 4 out of 17, Fallow deer 2 out of 14, Sambar deer 2 out of 13, Ariels 1 out of 7, Bactrian camel 2 out of 13, Giraffe 1 out of 2, Nilgai 2 out of 7, Scimitar horned oryx 2 out of 10, Addax 1 out of 4, Black buck 2 out of 7, Ibex 4 out of 16, Arawi sheep 10 out of 77, Deffasa water buck 1 out of 5 and White bearded gnu 1 out of 3. But in Llama, Eland, Sable antelope and Beisa oryx no positive results were obtained.

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In Alexandria zoo, 10 out of 53 animals "18.867%" give positive results to Chlamydia. The prevalence of infection in different animals were, Bactrian camel 1 out of 3, Scimitar horned oryx 1 out of 3, Ibex 2 out of 16 and Arawi sheep 6 out of 22. But in Ariels, Giraffe, Nilgai and Red lechwe no positive results were obtained.

In El-Mansoura zoo, 2 out of 11 animals "18.18%" were give positive results to Chlamydia. The prevalence of infection in Arawi sheep 2 out 8. But in Other animals no positive results were obtained.

Chlamydia was isolated in mice and yolk sac.

Mixed infections were found in 6 out of 265 wild ruminant. These animals suffering from cough, diarrhoea and keratoconjunctivitis. In Giza zoo 5 out of 201 were infected by mixed infection. The prevalence of infection in different animals were Egyptian deer 1 out of 17 (Chlamydia + Adenovirus); Sambar deer 1 out of 13 (Adenovirus + PI-3 virus); Scimitar horned oryx 1 out of 10 (Chlamydia + PI-3 virus); Ibex 1 out of 16 (Chlamydia + Adenovirus) and Arawi sheep 1 out of 77 (Chlamydia + Adenovirus). In Alexandria, 1 out of 53 animals were infected with mixed infection [Arawi sheep 1 out of 27 (Chlamydia + PI-3 virus)].

Chlamydia was isolated in 3 out of 5 human that in contact with infected wild ungulates.



## ***CONCLUSION***

Owing to widely opening of zoological gardens in Egypt and increasing their number in most Governorate of the Republic, owing to the transference of the animals of those gardens from the mother garden at Giza to other gardens and vice versa, owing to the existence some diseases especially viral diseases and Chlamydia which may spread from wild animals to domestic animals and even to human beings we recommend the following:

- (1) These animals should not be transfers from one garden to another before examination in order to discover any disease to be sure that the animals completely healthy.
  - (2) The diseased animals should not mix with domestic animals to prevent spreading infection to them.
  - (3) Periodic examination should be done to those who work in the garden -veterinarians and workers- to make sure that they are free from these diseases so that they may not spread to the animals or to those who work in the garden.
  - (4) Making periodic vaccination to these animals against viral diseases and Chlamydia in order to protect them from those diseases.
  - (5) These gardens should be provided with equipped laboratories for examining the animals periodically to make sure that they are free from these diseases.
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- (6) Medical supervision in these gardens should be given to the veterinarians who are specialized in preserving these animals because some gardens are entirely empty from veterinarians.
- (7) Future research should be carried out in different topic of wild animals diseases putting in concern the help of the researcher to get samples from these gardens easily to complete their researches on these animals far from bureaucracy and routine.

The obtained results confirmed that subclinical infection by Parainfluenza, Infectious bovine rhinotracheitis, Adenoviruses and Chlamydia can occur in wild animals and it could constitute a reservoir and may transmit these diseases to other domestic animals and humans.