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Research Article

Parasitic infestation in Peafowl of Bahawalpur Zoo, Punjab, Pakistan

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Accepted 15 September 2014

Abstract

The present study was conducted to find out the Parasitic infestation in peafowl of Bahawalpur Zoo from May 2011 to April 2012. Different methods were used to collect and identify the parasites in peafowl. About 30.7% of peafowl's were infected with external parasitic infestation. *Menacanthus stramineus* 12.19% was found to be high prevalent. It was revealed that Blue peafowl (*pavo criatus*) was mostly 36.66 % suspected to parasitic infestation followed by Green java (*pavo muticus*) 29.26 %. Mixed parasites were found in majority of peafowl but louse were highly prevailed.

Keywords: Parasites, parasitic infestation, peafowl's

INTRODUCTION

Parasitic infestation in birds is a common problem . Birds in captivity are liable to suffer from a number of behavioral problems, and stress-related health when placed in situations where environmental and social deprivations exist. The absence of certain key stimuli in physical environment of captive birds can result in failure to express certain behavioral patterns (Thompson, 1996).

Peacocks are omnivore medium sized birds forming the family *Phasianidea* belonging to order Galliformes. The peacock commonly known as common blue peafowl. The male peafowl called as peacock and female peafowl known as peahens. Peacock family also includes jungle fowls, pheasants , and partridges .Peafowl's are most commonly found in dry savanna areas and in forest. Peacock is the bird of forest edges and scrub-jungles, showing affinity to dry deciduous and , moist and semiarid biomes. It is found along streams with good vegetation found in Agriculture fields, and close to human habitation in semi-feral condition (Johnsgard, 1986).

There are two main species of peacock, the Green peacock and the Indian blue peacock which have a strain of white peafowl, Peacocks are found in Pakistan , India and Sri Lanka. India covering a vast majority of peafowl ran from outer Himalaya to peninsula Peafowl's have been maintained in captivity across the world for centuries and there are introduced populations in USA , Hawaii Islands , West Indies , South Africa , New Zealand , Europe , Australia etc. On the economic point of view, peafowl have economic significance to humans. The peacock is a wild bird by nature; they have been domesticated in many countries. In Zoos and parks, people are privileged to see many variations of peacocks, blue, green, gold, and white and purple colors attract people. The Romans graced their table with peacock meat and kept the bird to decorate their land .The peacock feather is used in form of ash or water as treatment against the snake bite and to treat various problems of lungs (Murari et al., 2005).

Peafowl's are hosts for a wide range of ectoparasites such as ticks, mites, lice, fleas and Trombiculid and certain endoparasites such as nematodes and insect larvae. These parasites mainly found on feathers and body, intestines, lungs and in blood (Mitchell et al., 1975; Ashraf et al., 2002). The parasitic infection transfer from infected to healthy birds by arthropod vectors, bird lice species and ectoparasites such as lice and ticks in peafowl's . The parasites

increase the body temperature of peacock, respiratory distress, Lateral recumbence and inability to fly (Ponnudurai et al., 2011).

The parasites production can be controlled by mixing of sulphamonomycin and diaveridine in the drinking water (Williams, 1978). Peafowl should be treated with Metronidazole, Tetracyclines, Fenbendazole, manually removed and to prevent from Ectoparasites birds treated with malathrin-piperonyl butoxide, carbaryl malathion, screen enclosures, Pyrethrin carbaryl powder (Sadler and Carpenter, 1996).

Birds in captivity are highly susceptible to parasitic infestation including both ecto and endoparasites. This may be due to high stocking density, hygiene practices, and poor sanitation and non-eliminating of infected individuals in free ranging condition.

MATERIALS AND METHODS

The study was performed for a period of 12 months from May, 2011 to April, 2012 in Bahawalpur zoo. Total two (2) species of peafowl existing like common blue peafowl and green peacock (green java) in Bahawalpur zoo, were kept in captivity selected for prevalence study. Parasites were collected by following methods. 1) Fumigation Chamber Method in which parasites were collected using the fumigation chamber method (Clayton and Drown, 2001) specifically adapted for gallinaceous birds. Plastic buckets were used and their depth was adjusted with pads to allow the bird examined to stand on the bottom. Bird was placed in these buckets for 20 min with a head taken out ectoparasites were killed with chloroform and removed with forceps. 2) Visual examination in which the ectoparasites were collected from host birds at Bahawalpur zoo. The legs of host birds immobilized with a strip of surgical tape (Lee and Clayton, 1995) and then with the help of both hands full body regions examined. The feathers of bird were contained different ectoparasites mostly near the neck region. The ectoparasites were removed with the help of forceps and put in separate bottles for preservation (Barnard and Morrison 1985). 3) Trapping in which the ectoparasites collected with the help of trapping method at Bahawalpur zoo. The host bird were banded at legs with tape and then put over a large pan of water into which parasites fall after feeding (Krantz, 1978). 4) Dust-ruffling in which the ectoparasites were collected at Bahawalpur zoo by using dust-ruffling method (Floyd and Tower, 1956). The pyrethrum powder which is slow killing insecticide with no side-effects (Casida, 1973; Jackson, 1985) applied on feathers of host birds and with the help of hand feathers ruffled over a collected surface that was cotton sheet and large piece of paper. Parasites collected and preserved (Walther and Clayton, 1996).

Then all collected parasites were preserved in 70% alcohol and 1 drop of glycerin added to prevent evaporation. The preserved samples were brought to the laboratory of Department of veterinary and animal sciences. The ectoparasites were identified by the method of (Durden, 2002) on the basis of their morphological characters, following the identification keys (Holland, 1985; Price *et al.*, 2003; Verma, 1993). Data were entered into Microsoft Excel spreadsheet. Prevalence of parasitic infestation was calculated as the number of infested individuals divided by the number of individuals examined and then multiplying the ratio by 100 (Le et al., 1995).

Prevalence = No. of individuals infested / No. of individuals examined x 100
 $P = 31/101 \times 100$

RESULTS

During the study period which extends from May, 2011 to April, 2012 examination of parasites from the two species of peafowl's (Total 101), 31(30.7%) were found positive for parasites (Table 1). Mixed parasites found in majority of the peafowls. The following parasites were identified in peafowl's: Chewing lice (*Menacanthus stramineus*), biting lice (*Columbicola columbae*), stick tight flea (*Echidnophaga gallinacean*) and tick (*Argus persicus*), (Table 2). Among the species of peafowl's the maximum parasites was recorded in blue peafowl (36.66%) and green peafowl (29.26%), (Table 3). The prevalence of *Menacanthus stramineus* and *Columbicola columbae* was found to be very high and their percentage of prevalence were 10% and 11.66% in blue peafowl, 12.19% and 7.31% in green peafowl. *Echidnophaga gallinacean* was 8.33% found in blue peafowl but was not highly prevalent in green peafowl only 4.87% found. *Argus persicus* was lowest 6.66% in blue peafowl and 4.87% in green peafowl found (Table 4). The most commonly detected parasitic infestation in peafowl was *Menacanthus stramineus* (10.89%) followed by *Columbicola columbae* (9.90%) and *Echidnophaga gallinacean* (6.93%) and *Argus persicus* (5.94%), (Table 5).

Table 1. Prevalence of ectoparasitic infestation in peafowl's of Bahawalpur zoo.

No. of Peafowl examined	No. of Peafowl's found positive	Prevalence %
101	31	30.7

Table 2. Ectoparasites isolated and identified in the peafowl's

Parasitic group	Genera
Lice	<i>Menacanthus stramineus</i> <i>Columbicola columbae</i>
Flea	<i>Echidnophaga gallinacean</i>
Tick	<i>Argus persicus</i>

Table 3. Prevalence of ectoparasite on individual peafowl species

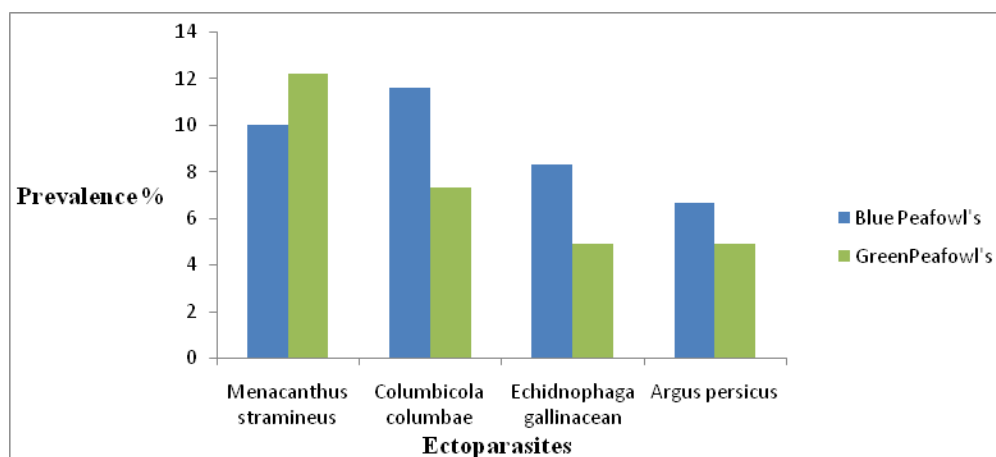
Peafowl species	Scientific name	Birds examined	Birds infested	Prevalence %
Blue Peafowl	<i>Pavo cristatus</i>	60	22	36.66
Green Peafowl	<i>Pavo muticus</i>	41	12	29.26

Table 4. Ectoparasites isolated and identified from the two species of Peafowls

Ectoparasites	Blue Peafowl (n=60)		Green Peafowl (n=41)	
	No. of infested birds	Prevalence %	No. of infested birds	Prevalence %
<i>Menacanthus stramineus</i>	6	10	5	12.19
<i>Columbicola columbae</i>	7	11.66	3	7.31
<i>Echidnophaga gallinacean</i>	5	8.33	2	4.87
<i>Argus persicus</i>	4	6.66	2	4.87

Table 5. Overall Prevalence of Ectoparasitic infestation in Peafowls of Bahawalpur Zoo

Ectoparasites	No. of infested Birds	Prevalence %
<i>Menacanthus stramineus</i>	11	10.89
<i>Columbicola columbae</i>	10	9.90
<i>Echidnophaga gallinacean</i>	7	6.93
<i>Argus persicus</i>	6	5.94

**Figure 1.** Overall Prevalence of ectoparasites in two Peafowl's of Bahawalpur Zoo

DISCUSSION

Parasitic infestation is one of the major problems causing mortality in wild animals in captive form (Rao and Acharjto, 1984). Zoo birds under captivity suspected to anemia, reduce growth, weight loss, illness and skin damage due to ectoparasites. Heavy infestations sometimes cause death of host (Arnall and Keymer, 1975).

The both species of peafowl found positive for parasitic infection (Table 1) and in all peafowl's mixed ectoparasites found were tick, lice and fleas (Table 2).

The maximum number of ectoparasites found in Blue peafowl followed by Green peafowl (Table 3). The two species of lice found in both species of peafowl's. The lice and tick were same as also noticed and reported by (Sadler and Carpenter 1996).

The lice species was highly prevailed, *Menacanthus stramineus* (10.89 %) followed by *Columbicola columbae* (9.90%) (Table 4). The lice species meets with the findings of which identified different five (5) species of lice in peafowl. The lice in peafowl also noticed (Green and Plama, 1991) but the species of lice different due to condition of host environment.

The lice specie which noticed by (Pilgrim and plama, 1982) were different at species level but of same family it is due to single study area and lesser number of birds under study due to which lesser number of host available.

During the study period which extends from May, 2011 to April, 2012 examination of parasites from the two species of peafowl's (Total 101), 31(30.7%) were found positive for parasites (Table 1). Mixed parasites found in majority of the peafowls. The following parasites were identified in peafowl's: Chewing lice (*Menacanthus stramineus*), biting lice (*Columbicola columbae*), stick tight flea (*Echidnophaga gallinacean*) and tick (*Arguspersicus*), (Table 2). Among the species of peafowl's the maximum parasites was recorded in blue peafowl (36.66%) and green peafowl (29.26%), (Table 3). The prevalence of *Menacanthus stramineus* and *Columbicola columbae* was found to be very high and their percentage of prevalence were 10% and 11.66% in blue peafowl, 12.19% and 7.31% in green peafowl. *Echidnophaga gallinacean* was 8.33% found in blue peafowl but was not highly prevalent in green peafowl only 4.87% found. *Argus persicus* was lowest 6.66% in blue peafowl and 4.87% in green peafowl found (Table 4). The most commonly detected parasitic infestation in peafowl was *Menacanthus stramineus* (10.89%) followed by *Columbicola columbae* (9.90%) and *Echidnophaga gallinacean* (6.93%) and *Argus persicus* (5.94%), (Table 5).

CONCLUSION

In present study the data on parasitic infestation in peafowl of Bahawalpur zoo were collected. Mixed types of ectoparasites were found in all infested peafowl's.

ACKNOWLEDGEMENT

I am grateful to the staff of Bahawalpur Zoo, who contributed in sample collection and analysis.

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