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Seasonal Variability of Endoparasites in the Excreta of Cattle Egret from Punjab and Haryana States

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Abstract: The Cattle Egret (*Bubulcus ibis*) is a bio-control agent, found commonly associated with cattle and is known for controlling cattle parasites. It is also recognized as a beneficial bird in agriculture due to its habit of preying on agricultural pests. Present study was carried out to investigate the endoparasites and their seasonal dynamics in the fecal samples of Cattle Egret. Freshly excreted fecal samples of Cattle Egret from Punjab Agricultural University, Ludhiana, and from the villages of Ludhiana (Punjab) and Jind (Haryana) were collected from August 2022 to July 2023 to conduct the study. Examination of the samples were done by fecal floatation and sedimentation methods which shows 14.44% were positive for the presence of parasitic eggs. Positive samples were infected with four endoparasitic species, a nematode (*Strongyloides avium* 7.77%), two Trematode (*Echinostoma* sp. 3.88% and *Nephrostomum* sp. 0.55%) and Apicomplexa (Coccidian oocyst 2.22%). Prevalence of nematode was highest with 53.8%, followed by trematode with 30.77% and coccidia with 15.38%. Season wise the prevalence of endoparasites was calculated and analysed statistically which shows season significantly affect the endoparasitic prevalence in Cattle Egret ($p<0.05$), being highest in Monsoon (28.33%), followed by summer season (13.33%), and winter season (1.67%). These results showed that chances of transmission of the parasites is more in monsoon season. During the field visits, we observe thirteen other avian species sharing feeding habitat with Cattle Egret at the selected locations which may lead to tramission of the parasites to other birds.

Key words: Avian species; Cattle Egret; Endoparasites; Nematode; Trematode.

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Wild birds like Cattle Egrets (*Bubulcus ibis*) may act as host for various ecto (mites, ticks, and fleas) and endoparasites (helminths) (Salah Eldein *et al.*, 2015; Udoye *et al.*, 2021). Cattle Egret has widespread distribution and is well-known for controlling cattle parasites and agricultural pests (Hussein and Rezk, 2016). They are called by this name because they are frequently seen feeding alongside cattle (Kour and Sahi, 2012). Birds are important host for a various infectious disease on a worldwide basis, particularly the free-living birds can act as vector for various pathogens. They play a crucial role in the epidemiology of human related zoonosis as they can

fly over great distances freely, avian influenza A virus is one of the most significant among them (El-Jakee *et al.,* 2014; Wille and Holmes, 2020). Helminthes (worms), protozoans and arthropods can act as endoparasites and can penetrate almost all the organs of animal (Krone, 2007). Nematode, Trematode and Cestode are common Helminth parasites of wild birds (Matur *et al*., 2010). Haemosporidians for example *Plasmodium* sp., and *Haemoproteus* sp. Also cause infection in wild birds (Omonona *et al*., 2014). Various parasites can cause infection in a bird species at a time and numerous parasites have adapted themselves according to birds. Parasitic oocyst and eggs not always lead to infection and diseases in birds but there are some nematodes which can cause diseases in birds, they mostly target gastrointestinal tract (Campbell, 1935; Borgsteede and Okulewicz, 2001; Papini *et al.,* 2012). Nematodes *Capillaria* and *Ascaridia gali* has been identified from the small intestine of various domestic as well as wild birds which can cause serious infections (Hoque *et al*., 2014; Yadav and Tandon, 1991). Parasites can also spread to healthy bird from infected one through insect vectors (Ponnudurai *et al.,* 2011). Present study was conducted with the aim to investigate endoparasitic species and their seasonal dynamics from excreta of Cattle Egrets.

Materials and Methods

Present study was carried out from August 2022 to July 2023 in villages of Ludhiana (Punjab), villages of Jind (Haryana) and Punjab Agricultural University (PAU), Ludhiana. Two villages were selected each from Ludhiana (Akalgarh and Sudhar) and Jind (Amarheri and Pandu Pindara) to collect the fecal samples of Cattle Egret. Samples were collected by direct observations during field visits from agricultural fields and cattle sheds, and by locating nesting and roosting sites of the bird in the selected villages. Plastic sheets were spread under the nesting and roosting tree of Cattle Egret so that fecal sample directly fall on the sheets and with the help of a sterile spatula, samples were collected in a sterile container having 10% formalin. A total of 180 fecal samples of Cattle Egret (60 in each season) were collected from all selected locations. Examination of the samples were done by floatation and sedimentation methods. Experiments were performed at Ornithology Laboratory, Department of Zoology, PAU, Ludhiana to find presence of endoparasitic eggs and their identification (Soulsby, 1982; Gupta and Singla, 2012). Microsoft excel 2013 was used for calculations using suitable formula and SPSS version 16 was used for the analysis of the data statistically by chi-square test.

Results and Discussion

Examination of fecal matter is a non-invasive method that permits the identification of parasitic eggs and evaluates the health of bird species. Present study shows the presence of four endoparasitic species belongs to Phylum Nematode (*Strongyloides avium*), Platyhelminthes (two trematodes from which one was identified as *Nephrostomum* sp. and one was *Echinostoma* sp.) and Apicomplexa (Coccidian oocyst) in the fecal samples of Cattle Egret. From the total examined samples, 14.44% were positive for endoparasite eggs and the prevalence of identified endoparasites from the positive samples is shown in Table 1, which shows highest prevalence of Nematode (53.85%). This result is similar to Harfoush *et al.* (2004) who reported high prevalence of nematodes (*Synhimantus* sp., *Heterocheilus* sp. and *Porrocaecum* sp.) in Cattle Egrets from Egypt. Trematodes, *Apharyngostrigea* sp., *Apatemon* sp., and *Nephrostomum* sp. were also reported by Harfoush *et al.* (2004) in Cattle Egrets in their study. Because of their direct life cycle helminthes are the most common parasites. *Strongyloides* sp. has also been recorded from the droppings of Indian Peafowl under captive facilities of Punjab,

Table 1. Overall endoparasites observed in the excreta of Cattle Egret

Phylum	Class	Species	No. infected	Percent infected
Nematode	Chromadorea	*Strongyloides avium*	14	53.85
Platyhelminthes	Trematode	*Echinostoma* sp.	7	26.92
		Nephrostomum sp.	1	3.85
Apicomplexa	Conoidasida	Coccidia	4	15.38
Total	-	-	26	100.00

Table 2. Location wise endoparasitic prevalance

Location	No. of samples Examined	No. of samples positive (%)	*Strongyloides avium*	*Echinostoma* sp.	*Nephrostomum* sp.	Coccidia
PAU	36	6 (16.66)	5 (13.88)	1 (2.77)	-	-
Village Akalgarh	36	3 (8.33)	2 (5.55)	-	-	1 (2.77)
Village Sudhar	36	4 (11.11)	3 (8.33)	-	1 (2.77)	-
Village Amarheri	36	7 (19.44)	3 (8.33)	2 (5.55)	-	2 (5.55)
Village Pandu Pindara	36	6 (16.66)	1 (2.77)	4 (11.11)	-	1 (2.77)
Total	180	26 (14.44)	14 (7.77)	7 (3.88)	1 (0.55)	4 (2.22)

Pakistan with 12.5% prevalence (Farooq *et al.*, 2020). Trematode, *Echinostoma* sp. was recorded by Adediran *et al*. (2015) from the posterior gut of adult Cattle Egret and *Nephrostomum oderolalensis* was recorded by Khan and Gazi, (2011) in Cattle Egret's intestine from Pakistan.

Prevalence of endoparasites in PAU, villages of Ludhiana (Punjab) and Jind (Haryana) shows non-significant difference (χ^2=2.20, P=0.332(2)). *Strongyloides avium* (13.88%) and *Echinostoma* sp. (2.77%) were present in positive samples from PAU. *Nephrostomum* sp. (2.77%) was observed only from the positive samples of Village Sudhar. *Strongyloides avium* and Coccidia were observed from the selected villages of Ludhiana and Jind, while *Echinostoma* sp. were recorded in the positive samples from the villages of Jind. The prevalence of identified endoparasitic eggs at different locations is shown in Table 2.

These types of studies mostly carried out in the feces of Captive birds and eggs of various endoparasite species has been recorded in different birds. *Capillaria*, *Ascaris* eggs and coccidian oocyst were observed from the feces of captive birds of Kankaria Zoo of Gujrat by Parsani *et al.* (2003). Studies has been conducted on fecal parasitic egg of House Crow in India and identified *Hymenolepis* sp, *Capillaria* sp, Isoptera oocyst, *Sarcocystis* sp with 12%, 19%, 24% and 20% prevalence respectively from Tamil Nadu (Prathipa *et al.,* 2015), Strongyle and cestode eggs with 38.09% and 4.76% prevalence respectively from Punjab (Sharma and Vashishat, 2017). Bairwa, (2024) recorded three nematodes (*Ascaridia* sp., *Heterakis* sp., and *Capillaria* sp.) and two cestode (*Hymenolepis* sp. and *Raillietina* sp.) in the fecal samples of wild birds from Kota (Rajasthan). Presence of these parasitic eggs and oocyst in the excreta of these birds can results in transmission of the parasites to other birds who are sharing habitat with them.

Season wise analysis of data shows highest prevalence of endoparasites in monsoon season with 28.33% and lowest in winter season with 1.67%, chi square analysis shows season had significant effect (χ^2=17.35, P=0.00(2)) on parasitic infection in Cattle Egrets (Table 3). As stated by Wijaya, (2015) high rainfall and humidity are associated with risk factors of infection with worm eggs. Field observation during the study period shows Cattle Egret share their feeding habitat with thirteen avian species namely Bank Myna, Common Myna, Common Moorhen, Eurasian Collared Dove, House Crow, Indian Black Ibis, Indian Pond Heron, Little Cormorant, Purple Swamphen, Rock Pigeon, White-breasted Waterhen, Rose-ringed Parakeet, and Red-wattled Lapwing with three different feeding guilds (Kumar *et al*., 2019) in the selected locations from which they can acquire and transmit parasites.

Conclusion

Cattle Egrets are considered as beneficial bird species for agriculture. Examination of their fecal samples is a non-invasive method which help us to identify the presence of parasite. Four endoparasitic eggs belong to phylum Nematode, Platyheminthes, and Apicomplexa

Table 3. Season wise endoparasitic prevalance

Season	Samples examined	Samples positive (%)	Chi-square value	P value (d.f.)
Summer	60	8 (13.33)		
Monsoon	60	17 (28.33)	17.35	0.000(2)
Winter	60	1 (1.67)		
Overall	180	26 (14.44)	-	-

were identified, these parasites can transmit to other bird species they share habitat. From the identified endoparasites, *Echinostoma* sp. has zoonotic significance. It is concluded from the study that season significantly affect parasitic prevalence in Cattle Egrets and there are more chances of transmission of parasitic infection in monsoon season.

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References

Adediran, O.A., Jubril, A.J., Uwalaka, E.C. and Jarikre, T.A. 2015. Parasites, haematology and morphological changes in tissues of a migratory *Bubulcus ibis*. *Scientific Journal of Zoology* 4(5): 26-31.

Bairwa, A. 2024. Endoparasite in wild birds of Kota: A comprehensive study on helminths. *International Journal of Veterinary Sciences and Animal Husbandry* 9(1): 80-83.

Borgsteede, F.H.M. and Okulewicz, A. 2001. Justification of the species Cyathosthoma (Hovorkonema) americanus (Chapin, 1925) (Syngamidae-Nematoda). *Helminthologia* 38: 151-154.

Campbell, J.W. 1935. The Gapeworm (Syngamus) in wild birds. *Journal of Animal Ecology* 4: 208-215. https://doi.org/10.2307/1010

El-Jakee, J.K., Osman, K.M., Ezzeldeen, N.A., Ali, H.A. and Mostafa, E.R. 2014. Chlamydia species in free-living Cattle Egret (*Bubulcus ibis*) and Hoopoe (*Upupa epops*) in Egypt. *International Journal of Veterinary Science and Medicine* 2(1): 1-6. https://doi.org/10.1016/j.ijvsm.2013.12.002

Farooq, Z., Bibi, R., Baboo, I., Abbas, K., Shahbaz, M., Iqbal, K.J., Hussain, D., Abrar, M., Chaudhry, A. and Hussain, T. 2020. Prevalence of Endoparasites in Indian Peafowl under captive facilities in the Punjab, Pakistan. *Biologia* 66(1): 155-161.

Gupta, S.K. and Singla, L.D. 2012. Diagnostic trends in parasitic diseases of animals. In: Gupta, R.P, Garg, S.R, Nehra, V. and Lather, D. (eds) Veterinary Diagnostics: Curr Trends. Pp 81-112. Satish Serial Publishing House, Delhi.

Harfoush, M. A., El-Shahawy, I. S. and Metwally, A. Y. 2004. Studies on some parasitic fauna of cattle egret (*Bubulcus ibis*) in Kafr El-Sheikh governorate. *Kafrelsheikh Veterinary Medical Journal* 2 (1):179-194. https://doi.org/10.21608/KVMJ.2004.112416

Hoque, M.A., Hassan, M.M., Haque, E, Shaikat A.H., Khan S.A., Alim A., Skerrat, L.F., Islam, A., Tun, H.M., Dissanayake, R., Day, T.K., Debnath, N.C. and Yamage, M. 2014. A survey of gastro-intestinal parasitic infection in domestic and wild birds in Chittagong and Greater Sylhet, Bangladesh. *Preventive Veterinary Medicine* 117: 305-312. https://doi.org/10.1016/j.prevetmed.2014.07.012

Hussein, S., and Rezk, H. 2016. Macro and microscopic characteristics of the gastrointestinal tract of the cattle egret (*Bubulcus ibis*). *International Journal of Anatomy and Research* 4 (2): 2162-2174. http://dx.doi.org/10.16965/ijar.2016.169

Khan, A. and Gazi, R.R. 2011. *Nephrostomum oderolalensis* n. sp. (Trematoda: Digenea) in cattle egret (*Bubulcus ibis* L.) from Sindh, Pakistan. *International Journal of Biology and Biotechnology* 8(4): 487-490.

Kour, D.N. and Sahi, D.N. 2012. Studies on the community ecology of cattle egrets *Bubulcus ibis* coromandus (Boddaert) in Jammu (Jammu and Kashmir), India. *International Journal of Biodiversity and Conservation* 4 (13): 439-445. https://doi.org/10.5897/IJBC11.105

Krone, O. 2007. Endoparasites. *Raptor, research and management techniques. Surrey: Hancock House Publishers*, 318-328.

Kumar, A., Kler, T.K. and Palot, M.J. 2019. Aves (Birds). In: *Faunal Diversity of Agroecosystem in India* 727-752. Zoological Survey of India, Kolkata.

Matur, B.M., Dawam, N.N. and Malann, Y.D. 2010. Gastro-intestinal helminth parasites of local and exotic chickens slaughtered in Gwagwalada, Abuja, Nigeria. *New York Science Journals* 3(5): 96-99.

Omonona, A.O., Ademola, I.O. and Ogunrotimi, M.O. 2014. Parasites of cattle egrets (*Bubulcus ibis*) and the associated haematological and biochemical changes. *Journal of Environmental Extension* 12(1):31-40.

Papini, R., Girivetto, M., Marangi, M., Mancianti, F. and Giangaspero, A. 2012. Endoparasites infections in pet and zoo birds in Italy. *Scientific World Journal* 1-9. https://doi.org/10.1100/2012/253127

Parsani, H. R., Momin, R. R., Sahu, R. K. and Patel, B. G. 2003. Prevalence of gastrointestinal parasites in captive birds at Kamla Nehru Zoological Garden, Kankaria Zoo, Ahmedabad, Gujarat. *Zoos' Print* Journal 18(1): 987-992.

Ponnudurai, G., Rajendran, K., Rani, N. and Harikrishnan, T.J. 2011. A note on parasitic infestation in Indian peacock. *Zoo's Print* 27(4): 1-32.

Prathipa, A., Gomathinayagam, S., Senthilkumar, K., Palanivelrajan, M., Niranjana, C. and Jayathangaraj, M.G. 2015. Endoparasitic infection in Indian house crow (*Corvus splendens*). *Zoos' Print Journal* February, 2: 16-17.

Salah-Eldein, A.M., Abd El-Aal, A.A., Kamel, A.M., Gamal-Eldein, M.A. and Amina, A.D. 2015. Prevalence of nematode parasites in cattle egret (*Bubulcus ibis*) in Egypt. *Suez Canal Veterinary Medical Journal* 20(2): 107-122. https://doi.org/10.21608/SCVMJ.2015.64604

Sharma, C. and Vashishat, N. 2017. Prevalance of endoparasites in House Crow (*Corvus Splendens*) from different agroecosystems of Ludhiana, Punjab. *International Journal of Agricultural Science and Research* 7(4): 577-582.

Soulsby, E.J.L. 1982. *Helminths, Arthropods and Protozoa of Domesticated Animals.* (7th ed) Baillière Tindall, London, 809 p.

Udoye, C.C., Ugbomeh, A.P., Robert, B., and Amuzie, C.C. 2021. Ecto, Endo and Hemoparasites of Cattle Egrets (*Bubulcus Ibis*) found at Mgbuoshimini Rumueme Abattoir, Port Harcourt. *Greener Journal of Biological Sciences* 11(1): 21-29.

Wijaya, N. H., 2015. Beberapa Faktor Risiko Kejadian Infeksi Cacing Tambang Pada Petani Pembibitan Albasia (Studi Kasus di Kecamatan Kemiri). M.Sc. Thesis, Program Magister Epidemiologi Pascasarjana. Universitas Diponegoro. Semarang.

Wille, M. and Holmes, E.C. 2020. Wild birds as reservoirs for diverse and abundant gamma-and deltacoronaviruses. *FEMS Microbiology Reviews* 44 (5): 631-644.

Yadav, A.K. and Tandon, V. 1991. Helminth parasitism of domestic fowl (*Gallus domesticus* L.) in a subtropical high-rainfall area of India. *Beitrage zur Tropischen Landwirtschaft und Veterinarmedizin* 29: 97-104.

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