

Prevalence Studies on Gastrointestinal Parasites in Poultry of District Udham Singh Nagar, Uttarakhand

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ABSTRACT

A study was conducted to investigate the prevalence of gastrointestinal parasites in backyard and commercial poultry in Uttarakhand over one year, from June 2018 to May 2019. A total of 3,335 samples from commercial chickens were collected randomly from eight tehsils of the district Udham Singh Nagar, Uttarakhand. The samples were examined for gastrointestinal parasites. Eight different gastrointestinal parasite eggs and oocytes were identified. Of these, four were nematodes (*A. galli*, *H. gallinarum*, *Capillaria* sp., and *Trichostrongylus* sp.), and three were cestodes (*Raillietina* sp., *Cotugnia* sp. and *Hymenolepis* sp.). *Eimeria* sp. was also found. Prevalence of different gastrointestinal helminths was higher in backyard poultry (60.44%), compared to commercial poultry (18.25%), while prevalence of *Eimeria* sp. was higher in commercial poultry (62.02%) than in backyard poultry (33.62%). There was a higher prevalence of nematodes (24.46%). The prevalence of helminths and *Eimeria* sp. was higher during the rainy season.

Keywords: Poultry, Gastrointestinal Parasites, Prevalence

INTRODUCTION

Poultry farming as a rural livelihood option has the potential to reduce rural poverty by providing good employment to the rural poor. However, diseases, especially various parasitic infestations, bring down the attainable income for the rural poor. Most helminthic infestations are chronic and affect adult birds. These infestations result in economic losses to the

farmers. Epidemiological studies of parasitic infestations in poultry are important to reduce economic losses by designing appropriate prophylactic measures. Since studies on gastrointestinal parasitic diseases of poultry are meagre in Uttarakhand, this study was undertaken in the district Udham Singh Nagar, Uttarakhand, to assess the prevalence of gastrointestinal parasitic diseases in poultry.

MATERIALS AND METHODS

Two types of samples were randomly collected: freshly laid droppings or droppings from the cloaca of the free-range backyard chicken and chicken from poultry farms. Gastrointestinal tracts were collected randomly from the chickens slaughtered at the local markets, shops, and poultry farms in seven tehsils of District Udham Singh Nagar of Uttarakhand. A total of 3,335 samples, both droppings and gastrointestinal tract samples, comprising of 1,618 (1,392 droppings and 226 gastrointestinal tracts) from backyard chickens and 1,717 (1,180 droppings and 537 gastrointestinal tracts), were collected during the study period from June 2018 to May 2019 and examined. The fecal samples were examined using direct smear examination, sedimentation, floatation, and the modified McMaster method, and the number of eggs/cysts/oocysts per gram of droppings was calculated.

To examine the intestinal contents, the intact gastrointestinal tract was placed in a dissecting tray, the mesentery was freed, and was separated into four parts: the esophagus and crop in one piece, gizzard with proventriculus, small intestine (duodenum, ileum, and

jejunum), and large intestine (caeca, colon, and rectum). The separated parts were cut longitudinally and immersed in lukewarm water for the release of worms embedded in the mucosa. Intestinal scrapings were examined for the presence of any parasitic infection, i.e., tapeworm heads, small tapeworms, and developmental stages of coccidian parasites. The intestinal contents were washed in separate Petri dishes, centrifuged, and examined for the presence of eggs and larval stages of parasites. Visible parasites were picked and fixed directly into the glycerol alcohol (50% glycerol: 50% alcohol) in the case of nematodes. Cestodes were fixed in 10% formalin. Collected parasites were identified as per Bhatia *et al.* (2004). The prevalence of various gastrointestinal parasites in poultry was calculated and season-wise presented.

RESULTS AND DISCUSSION

The prevalence of gastrointestinal parasites in poultry is presented in Table I. Overall

Prevalence Studies... by Mukesh Yadav et al prevalence of gastrointestinal helminth parasites was observed to be 38.47% (60.44% in backyard poultry and 17.76% in commercial poultry), while the overall prevalence of protozoan parasites was 48.21% (33.62% in backyard poultry and 62.02% in commercial poultry). In case of the helminths, a higher prevalence of 60.44% was recorded in backyard poultry as compared to 17.76% in commercial poultry, while in protozoa, a higher prevalence of 62.02% was observed in commercial poultry, with 33.62% in backyard poultry. Among helminths, an overall higher prevalence was observed in nematodes (24.46%), followed by cestodes (8.57%) and mixed infestation (5.42%). These findings are in concurrence with the report of 37.6% by Agbolade *et al.* (2014), although a higher prevalence of 92.6% was recorded by Mikail and Adamu (2008), and of 63.6% by Ogbaje *et al.* (2012). The prevalence of the protozoan parasites was observed to be similar to that of Sreedevi *et al.* (2016).

Table I: Overall Prevalence of Gastrointestinal Parasites in Poultry

System of Rearing	Materials Collected	Samples Examined	Samples Positive	Helminths			Protozoa
				Cestodes (%)	Nematodes (%)	Mixed Infestation (%)	<i>Eimeria</i> sp (%)
Backyard	Droppings	1392	833 (59.84)	15.58	36.70	7.47	33.33
	GI tract	226	145 (64.15)	14.15	39.38	10.62	35.40
	Total	1618	978 (60.44)	15.38	37.08	7.97	33.62
Commercial	Droppings	1180	197 (16.69)	1.31	12.65	2.71	61.44
	GI tract	537	108 (20.11)	4.09	12.47	3.54	63.31
	Total	1717	305 (17.76)	2.15	12.58	3.02	62.02
Overall		3335	1283 (38.47)	8.57	24.46	5.42	48.21

(Figures in parentheses indicate percentages of the total samples examined)

However, examination of droppings and gastrointestinal tracts of commercial poultry revealed an overall prevalence of 16.69% and 20.11%, respectively. These results are similar to those of Jegede *et al.* (2015). This study also revealed a higher overall prevalence of nematodes (26.64%), followed by cestodes (8.57%) and mixed infection (4.41%). Similar findings were made by Sahu and Sinha (2016).

Seasonal Prevalence of Gastrointestinal Parasites in Backyard Poultry

i). Based on Examination of Droppings

As per the results presented in Table II, maximum prevalence was recorded in the rainy season (63.95%), followed by summer (59.18%) and winter (54.95%) seasons. Among

Prevalence Studies... by Mukesh Yadav et al nematodes, maximum prevalence of *Ascaridia galli* was recorded in the rainy season (22.28%), followed by summer (20.31%) and winter (18.57%) seasons. *Heterakis gallinarum* was prevalent mostly in the rainy season (9.68%), followed by summer (8.98%) and winter (8.79%) seasons. The highest prevalence of *Capillaria* sp. was observed in the rainy season (6.20%), followed by summer (5.27%) and winter (4.67%) seasons. Among cestodes, the highest prevalence of *Raillietina* sp. was noticed in the rainy season (16.27%), followed by summer (15.82%) and winter (14.28%) seasons. The highest prevalence of *Eimeria* sp. was found in the rainy season (34.49%), followed by summer (34.17%) and winter (29.10%) seasons.

Table II: Seasonal Prevalence of Gastrointestinal Parasites based on Examination of Droppings in Backyard Poultry

Season	Samples examined	Samples positive	Helminths						Protozoa	
			Cestodes		Nematodes				Mixed Infestation (%)	<i>Eimeria</i> sp. (%)
			<i>Raillietina</i> sp. (%)	<i>Ascaridia galli</i> (%)	<i>Heterakis gallinarum</i> (%)	<i>Capillaria</i> sp. (%)	<i>Trichostrongylus</i> sp. (%)			
Rainy (Jul-Oct.)	516	330 (63.95)	16.27	22.28	9.68	6.20	1.55	7.94	34.49	
Winter (Nov-Feb.)	364	200 (54.95)	14.28	18.57	8.79	4.67	1.37	7.14	29.10	
Summer (Mar-Jun)	512	303 (59.18)	15.82	20.31	8.98	5.27	1.40	7.42	34.17	
Overall	1392	833 (59.84)	15.58	20.61	9.19	5.45	1.37	7.47	33.33	

(Figures in parentheses indicate percentages of the total samples examined)

ii). Based on Post-Mortem Examination

Maximum prevalence (Table III) was found in the rainy season (69.33%), followed by summer (61.77%) and winter (60.27%) seasons. Among nematodes, maximum prevalence of *Ascaridia galli* was recorded in the rainy season (26.66%), followed by winter (21.91%) and summer

(20.51%) seasons. *Heterakis gallinarum* was found to be most prevalent in the rainy season (16.00%), followed by summer (12.82%) and winter (8.21%) seasons. Maximum prevalence of mixed infection was found in summer (12.82%), followed by winter (9.58%) and rainy (9.33%) seasons, while higher prevalence of

Eimeria sp. was recorded in the rainy season (39.66%), followed by winter (37.19%) and summer (28.64%) seasons.

Table III: Seasonal Prevalence of Gastrointestinal Parasites based on Post-Mortem Examination in Backyard Poultry

Season	Samples examined	Samples positive	Helminths							Protozoa	
			Cestodes			Nematodes				Mixed infestation (%)	<i>Eimeria</i> sp. (%)
			<i>Raillietina tetragona</i> (%)	<i>R. echinobothridia</i> (%)	<i>Cotugnia</i> sp. (%)	<i>Hymenolepis</i> sp. (%)	<i>Ascaridia galli</i> (%)	<i>Heterakis gallinarum</i> (%)	<i>Capillaria</i> sp. (%)		
Rainy (Jul-Oct)	75	53 (69.33)	5.33	2.67	2.66	2.66	26.66	16.00	5.33	9.33	39.66
Winter (Nov-Feb)	73	44 (60.27)	4.10	4.10	2.73	5.47	21.91	8.21	4.10	9.58	37.19
Summer (Mar–Jun)	78	48 (61.77)	3.84	2.56	3.84	2.56	20.51	12.82	2.57	12.82	28.64
Overall	226	145 (64.15)	4.42	3.17	3.09	3.53	23.00	12.38	3.98	10.62	35.40

(Figures in parentheses indicate percentages of the total samples examined)

Seasonal Prevalence of Gastrointestinal Parasites in Commercial Poultry

i). Based on Examination of Droppings

As found in Table IV, higher prevalence of gastrointestinal helminths was observed in rainy season (20.50%), followed by summer (14.57%) and winter (14.24%) seasons. Among nematodes, higher prevalence of *Ascaridia galli*

was recorded in rainy season (7.60%), followed by summer (6.44%) and winter (6.33%) seasons. Higher prevalence of *Heterakis gallinarum* was noticed in rainy season (5.27%), followed by summer (3.67%) and winter (3.31%) seasons. A higher prevalence of *Eimeria* sp. was recorded in rainy season (71.32%), followed by summer (61.88%) and winter (51.09%).

Table IV: Seasonal Prevalence of Gastrointestinal Parasites based on Examination of Droppings in Commercial Poultry

Season	Samples examined	Samples positive	Helminths						Protozoa	
			Cestodes		Nematodes				Mixed Infestation (%)	<i>Eimeria</i> sp. (%)
			<i>Raillietina</i> sp. (%)	<i>Ascaridia</i> galli (%)	<i>Heterakis</i> gallinarum (%)	<i>Capillaria</i> sp. (%)	<i>Trichostrongylus tenuis</i>			
Rainy (Jul-Oct)	445	92 (20.50)	1.92	7.60	5.27	1.38	0.60	3.74	71.32	
Winter (Nov-Feb)	296	42 (14.24)	0.86	6.33	3.31	1.03	0.65	2.02	51.09	
Summer (Mar–Jun)	439	63	1.13	6.44	3.67	0.68	0.52	2.35	61.88	

		(14.57)							
Overall	1180	197 (16.49)	1.31	6.79	4.08	1.02	0.59	2.64	61.44

(Figures in parentheses indicate percentages of the total samples examined)

ii. Based on Post-Mortem Examination

Higher prevalence (Table V) of parasites was recorded in rainy season (22.61%), followed by summer (18.89%) and winter (18.63%). Among nematodes, maximum prevalence of *Ascaridia galli* was in rainy season (7.0%), followed by summer (6.67%) and winter (5.29%). *Heterakis gallinarum* was more prevalent in rainy season (6.48%), followed by winter (4.06%) and summer (3.88%). Higher prevalence of *Eimeria* sp. was seen in rainy

season (67.98%) followed by summer (62.43%) and winter (59.30%). Significant relationships between seasons and prevalence were recorded by Sreedevi et al. (2016). The findings of this study are also in agreement with Alam et al. (2014) and Hembrem et al. (2015) who too reported higher prevalence of infestation during rainy season. However, Solanki et al. (2015) and Rehman et al. (2016) found maximum prevalence of helminths during winter.

Table V: Seasonal Prevalence of GI Parasites based on Post-Mortem Examinations in Commercial Poultry

Season	Samples examined	Samples positive	Helminths							Protozoa
			Cestodes			Nematodes			Mixed Infestation (%)	
			<i>R. tetragona</i> (%)	<i>R. echinobothria</i> (%)	<i>Hymenolepis</i> (%)	<i>Ascaridia galli</i> (%)	<i>Heterakis gallinarum</i>	<i>Capillaria</i> sp. (%)		
Rainy (Jul-Oct)	185	42 (22.61)	1.63	1.07	1.08	7.00	6.48	1.62	3.78	67.98
Winter (Nov-Feb)	172	32 (18.63)	1.74	1.14	1.74	5.29	4.06	1.16	3.48	59.30
Summer (Mar-Jun)	180	34 (18.89)	1.12	1.70	1.11	6.67	3.88	1.11	3.33	62.43
Total	537	108 (20.11)	1.48	1.31	1.31	6.34	4.84	1.31	3.54	63.31

(Figures in parentheses indicate percentages of the total samples examined)

CONCLUSION

It can be concluded that both backyard and commercial poultry suffered from gastrointestinal parasitism throughout the year in the district US Nagar, Uttarakhand, with higher infestations during rainy seasons. While prevalence of helminths was more in backyard

chicken, prevalence of *Eimeria* sp was more in commercial farms.

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REFERENCES

- Agbolade, O.M., A.S.Arosoye, E.C.Akajiugo, H.A.Akinyemi, A.M.Owolowo, O.Ariba and K.A.Jonathan (2014), Gastrointestinal parasites of domestic fowls from Ijebu north, south-western Nigeria, *Basic Research Journal of Agricultural Science*, **3(7)**: 60-64.
- Alam, M.N., M. Mostofa, M.A. Khan, M.A. Alim, A.K. Rahman and A.A. Trisha (2014), Prevalence of gastrointestinal helminth infections in indigenous chickens of selected areas of Barisal district, Bangladesh, *Bangladesh Journal of Veterinary Medicine*, **12(2)**: 135-139.
- Bhatia, B.B., K.M.L.Pathak and P.D.Juyal (2004), Textbook of Veterinary Parasitology. Kalyani Publishers, India.
- Hembram, A., M.R.Panda, B.N.Mohanty, C.R.Pradhan, M.Dehuri, A.Sahu and M.Behera (2015), Prevalence of gastrointestinal helminths in Banaraja fowls reared in semi-intensive system of management in Mayurbhanj district of Odisha, *Veterinary World*, **8(6)**: 723-726.
- Jegade, O.C., I.A.Asadu, M.Opara, S.S.Obeta and D.O.Olayemi (2015), Gastrointestinal parasitism in local and exotic breeds of chickens reared in Gwagwalada Guinea Savannah zone of Nigeria, *Sokoto Journal of Veterinary Sciences*, **13(3)**: 25-30.
- Prevalence Studies... by Mukesh Yadav et al Mikail, H.G. and Y.A.Adamu (2008), A survey of gastro-intestinal helminths of chickens in Sokoto Metropolis, Nigeria, *Nigerian Veterinary Journal*, **29(1)**: 72-75.
- Ogbaje, C.I., E.O.Agbo and O.J.Ajanusi (2012), Prevalence of *Ascaridia galli*, *Heterakis gallinarum* and Tapeworm Infections in birds slaughtered in Makurdi Township, *Int. J. Poult. Sci.*, **11(2)**: 103-107.
- Rehman, T., L.Zada, A.Ahmad and M.A.Zeb (2016), Prevalence rate of *Raillietina cesticillus* in domestic chickens of District Mardan, KPK, Pakistan, *International Journal of Medicine and Biomedical Sciences*, **1(2)**:13-16.
- Sahu, S. and K.P.Sinha (2016), Studies on the prevalence of helminthic infection in desi poultry birds from Darbhanga region of North Bihar, India, *International Journal of Fauna and Biological Studies*, **3(3)**:87–90.
- Solanki, J.B., N.Kumar, A.Varghese, B.J.Thakre and G.Puri (2015), Prevalence of gastrointestinal parasitism in poultry in and around Navsari area of South Gujarat, *Livestock Research International*, **3(1)**: 28-30.
- Sreedevi, C., C.Jyothisree, V.R.Devi, P.Annapurna and L.Jeyabal (2016), Seasonal prevalence of gastrointestinal parasites in desi fowl (*Gallus gallus domesticus*) in and around Gannavaram, Andhra Pradesh, *Journal of Parasitic Diseases*, **40(3)**, 656-661.