Volume : 2 | Issue : 9 | September 2013 • ISSN No 2277 - 8179

Research Paper

Prevalence of Gastrointestinal Helminth Parasites of Gallus Gallus Domesticus in and Around Latur District M.s.india

Zoology

KEYWORDS : Gastrointestinal Helminth parasites; Latur District, Prevalence.

DHANRAJ BALBHIM BHURE	Research and Post Graduate Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India.
SANJAY SHAMRAO NANWARE	Research and Post Graduate Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India.
M.U. BARSHE	Research and Post Graduate Department of Zoology, Yeshwant Mahavidyalya, Nanded-431602 M.S.India.

ABSTRACT

A study was conducted to investigate prevalence of helminth parasite of Gallus gallus domesticus in and around Latur district, M.S.India during October, 2011 to September, 2012. Four genera viz. Cotugnia, Daivenia, Raillietina and Vallipora belonging to Class Cestoda and two genera i.e. Heterakis sp. and Ascardia sp.belonging from Class Nematoda were recorded during this investigation from four localities i.e.Latur, Chakur, Ahmedpur and Udgir of Latur District. The high prevalence were recorded during Summer seasons followed by winter seasons where as low prevalence were reported during Monsoon Seasons of four localities of Latur districts.

The high prevalence were reported due to infection of cestode parasites where as low prevalence were reported due to nematode infection. The prevalence of gastrointestinal parasites of Gallus gallus domesticus, the genera of helminth parasites, species and the severity of infection also vary considerably depending on local environmental conditions such as humidity, temperature, rainfall, vegetation and management practices.

Introduction

Birds are important components of ecosystem. They are important from ecological, medicinal, nutritional and economical point of view. Man uses many birds as delicious and nutritious food. Similarly birds also produce some important products like meat, eggs and beautiful feathers. The common internal parasitic infections occur in domestic fowl include cestodes, trematode and nematodes. These worm infections may cause considerable damage and great economic loss due to malnutrition, decreased feed conversion ratio, weight loss, and death in young ones.

Intensive breeding of poultry lead to an increased problems facing the poultry industry that was emerged during last four decades. Among the problems facing extensive types of production of chickens in worlds are parasitic diseases. Helminthiasis was considered to be important problems in chickens (Jansen and Pandey 1989) and (Abebe et al., 1997). Helminthe parasites were incremineted as major causes of unsoundness and lowering performance of poultry in Egypt (Khater, 1993). Avian helminthesis constitutes one of the most common endoparasitism causing serious troubles in chicken production. Chicken cestodiasis not only cause loss of body weight of the raised chickens but also may cause several problems in affected flocks such as enteritis, loss of blood, loss of production, nervous manifestations and death (Calneck et al., 1997). Also, cestodes specially *Davainea* spp. penetrate deeply into an intestinal mucosa and produce marked enteritis which is frequently hemorrhagic in heavy infestation (Soulsby, 1982).

Animals like domestic fowl, *Gallus gallus domesticus* have a great Socio-economic importance than other animals domesticated by humans. It is an important item of human food as well as the source of income due to the production of meat and other substances. Farmers of Marathwada Region used fertilizer which is formed from domestic fowl in their fields to increase soil fertility. But these domestic fowl are infected with helminth infection which is responsible for mortality and economic losses in a number of instances, causes many diseases to human beings.

The present investigation deals with the study of prevalence of helminth parasites of *Gallus gallus domesticus*.

Materials and Methods

Study area-

The study was conducted from four selected sites, in Latur district. These include Latur, Chakur, Ahmedpur and Udgir.

Latur District is situated in the state of Maharashtra and covers a total area of 7,157 sq kms in the Deccan plateau. Latur district has an ancient historical background. Latur district is located in the south-eastern part of the state of Maharashtra. It is located between 17 degree 52 minutes north and 18 degree 50 minutes north latitude and 76 degrees 18 minutes east to 79 degrees 12 minutes east in the Deccan plateau. The district is situated on the Maharashtra-Karnataka boundary. On the eastern side of Latur is the Bidar district of Karnataka, whereas Nanded is on the northeast, Parbhani on the northern side, Beed district on the northwest and Osmanabad on the western and southern side. The entire district of Latur is situated on the Balaghat plateau, 540 to 638 metres above mean sea level.



Sample Collection and Examination Procedure –

The intestine of *Gallus gallus domesticus* were collected from slaughter houses of Latur, Chakur, Ahmedpur and Udgir during one annual cycles i.e. October, 2011 to September, 2012. The various organs of the viscera such as stomach, intestine, liver and caecum were kept in separate container. Each piece was identified and incised longitudinally, visible worms to the naked eye were picked up using thumb forceps and the content placed in separate beakers containing physiological saline. The mucosae of the intestine were washed to remove any adhering worms and added to the container containing intestinal content. The container was filled up with water and left to settle. The supernatant was decanted and re- filled with tap water. This process

Volume : 2 | Issue : 9 | September 2013 • ISSN No 2277 - 8179

was repeated several times. Then the content was sieved, emptied on a petridish and examined under low power microscopy (10X).To facilitate subsequent examination and identification. Recorded the data of infected and normal hosts examined.

The prevalence of helminth parasites is calculated by following formula.

$$\text{Prevalence} = \frac{\text{Infected hosts}}{\text{Total hosts examined}} \times 100$$

Results

The prevalence of gastrointestinal helminth was showing in Table No.1. The high prevalence were recorded by cestode parasites as compared to nematode parasites. High infection of all the parasites were recorded in summer season i.e. *Cotugnia sp. (*72.91%*), Davainea sp.(* 72.39%*), Raillietina sp. (*73.95 *%) Vallipora sp.(* 69.79 *%), Ascardia sp. (*66.14 *%)* and *Heterakis sp. (*62.50 *%)* followed by winter Season 47.91%, 49.47%, 41.66 %, % 43.22 %, 39.06% and 36.45 % respectively where as low infection were recorded in monsoon season 25.52 %, 23.43 %, 25.00 %, 19.79 %, 23.95 % and18.22 % respectively.

Table 1: Showing Prevalence of helminth parasites of *Gallus gallus domesticus* from Latur district during Oct., 2011 to Sept., 2012

S. N.	Name of species	Study Area and No. of Infected hosts 48 Host were examined for infection from each sites in each seasons. Prevalence %												Total No. of Infected host out of 192 examined in each seasons		
		Latur			Chakur			Ahmedpur			Udgir					
		W	S	M	W	S	M	W	S	M	W	S	M	W	S	M
I	Cestodes															
1	Cotugnia sp.	(24)	(36)	(13)	(26)	(38)	(13)	(22)	(34)	(11)	(20)	(32)	(12)	(92)	(140)	(49)
		50.00	75.00	27.08	54.16	79.16	27.08	45.83	70.83	22.91	41.66	66.66	25.00	47.91	72.91	25.52
2	Davainea sp.	(26)	(34)	(12)	(24)	(35)	(14)	(23)	(36)	(10)	(22)	(34)	(09)	(95)	(139)	(45)
		54.16	70.83	25.00	50.00	72.91	29.16	47.91	75.00	20.83	45.83	70.83	18.75	49.47	72.39	23.43
3	Raillietina sp.	(21)	(39)	(14)	(20)	(37)	(11)	(21)	(33)	(12)	(18)	(33)	(11)	(80)	(142)	(48)
		43.75	81.25	29.16	41.66	77.08	22.91	43.75	68.75	25.00	37.50	68.75	22.91	41.66	73.95	25.00
4	Vallipora sp.	(22)	(35)	(11)	(21)	(33)	(09)	(19)	(31)	(08)	(21)	(35)	(10)	(83)	(134)	(38)
		45.83	72.91	22.91	43.75	68.75	18.75	39.58	64.58	16.66	43.75	72.91	20.83	43.22	69.79	19.79
II	Nematodes															
5	Ascardia sp.	(19)	(30)	(10)	(17)	(31)	(11)	(21)	(32)	(12)	(18)	(34)	(13)	(75)	(127)	(46)
		39.58	62.50	20.83	35.41	64.58	22.91	43.75	66.66	25.00	37.50	70.83	27.08	39.06	66.14	23.95
6	Heterakis sp.	(17)	(28)	(08)	(18)	(30)	(09)	(19)	(33)	(11)	(16)	(29)	(07)	(70)	(120)	(35)
		35.41	58.33	16.66	37.50	62.50	18.75	39.58	68.75	22.91	33.33	60.41	14.58	36.45	62.50	18.22

W- Winter, S-Summer M- Monsoon; value in bracket indicates the number of infected hosts in each season and localities while value without bracket indicates prevalence of infection.

Figure1. Graph showing prevalence of helminth parasites of *Gallus gallus domesticus* from each localities of Latur district during Oct., 2011 to Sept., 2012.

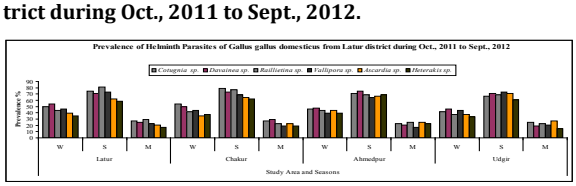
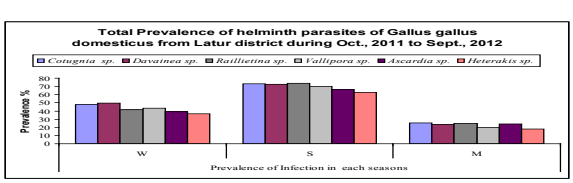


Figure2. Graph showing Total prevalence of helminth parasites of *Gallus gallus domesticus* from Latur district during Oct., 2011 to Sept., 2012.



Discussion

Gastrointestinal parasite infections are a world-wide problem for both small- and large-scale farmers. Infection by gastrointestinal parasites in sheep can result in severe losses. Economic losses are caused by gastrointestinal parasites in a variety of ways: they cause losses through lowered fertility, reduced work capacity, involuntary culling, a reduction in food intake and lower weight gains, treatment costs, and mortality in heavily parasitized animals (Hansen and Perry 1994 and Waller, 2006). Regarding to clinical signs due to parasitic infestation were varied from asymptomatic to adverse signs as diarrhea, paleness or ictric of visible mucous membrane, emaciation, shedding of wool and submandibular edema. The clinical finding of parasitic infestation varied depending on the number of infective stage and the time taken after ingestion. A similar signs were observed by Maingi and Mathenge, (1995) and Anwaar (2000).

Overall infection of all helminth parasites, the high prevalence were recorded in winter season followed by summer while low in monsoon season. Similar results were also reported by Bhure et. al.,2010. He studied survey of the population ecology of *Rhabdochona* Ralliet, 1916 (Nematoda-Rhabdochonidae) from *Labeo rohita (Ham. and Buch.)* His result indicate that the high incidence of infection (51.78%), intensity of infection (1.18%) and density of infection (0.613%) of *Rhabdocona sp*. occur in summer season followed by winter season and rainy season.

Bhure et. al., 2010 also studied the high incidence, intensity, density and index of infection of nematode parasites *Spinitectus corti* Moorthy,1938 are occurred in summer season followed by winter season whereas lower infections in monsoon season.

Tambe et.al., 2011 reported the seasonal variation of gastrointestinal helminthic infection of *Capra hircus* shows the higher prevalence occurs in monsoon (95%) followed by winter (87%) and summer (73%) because of easy dispersal of larvae in pasture resulting is increased in contact with the host and the parasites. Among the helminth parasites maximum incidence occurs due to cestode parasites in all seasons (48.33%) followed by nematodes (26.66%) and trematode (10%) respectively. Shukla et.al., 2011 studied the seasonal variation of tapeworms in *Gallus gallus domesticus* at Ahmednagar region, her finding focus on high prevalence of *Raillietina* parasite are occurred in winter season followed by summer season and low in rainy season. Padwal 2011 recorded the high prevalence of *Trichuris* sp. are recorded in the month of December, 2008 and November, 2009 i.e. 82.8% and 85.0% respectively followed by in the month of March, 2009 and February, 2010 i.e. 60% and 70% respectively where as low prevalence are recorded in the month of August, 2008 and July, 2009 i.e. 50% and 31.5% respectively.

The prevalence of gastrointestinal parasites, the genera of helminth parasites, species and the severity of infection also vary considerably depending on local environmental conditions such as humidity, temperature, rainfall, vegetation and management practices. Climatic conditions are responsible for the distribution and prevalence of the disease. The effect of climatic factors on helminthes have elaborately studied by Kennedy (1968, 1971), Lawrence (1970), Crofton Patric and Esch (1977). The considerable work on population dynamics were carried out by many authors, such as Esch (1977), Ram Reddy (1980).The study on population dynamics of helminth parasites of rats from Hyderabad was done by Susheela (1987). The season, host, age and sex affect the distribution of endohelminths from Catostomus commersoni (Lawrence, 1970). The seasonal incidence of painted turtle studied by Patrick and Esch.(1977). Helminth parasites made their impact on the livestock in the developing countries (Over, H.J. et al. 1992). The fluke causes many diseases to domestic animals (Anon, 1994). Bhure et. al., 2006-2011 studied population dynamics of helminth in freshwater fishes. His results indicate the high prevalence recorded in summer months as compared to other seasons.

Conclusion

The high prevalence were recorded during summer seasons followed by winter seasons where as low prevalence were reported during Monsoon Seasons of four localities of Latur districts. The high prevalence were reported due to infection of cestode parasites where as low prevalence were reported due to nematode infection. This type of results indicated that environmental factors and feeding habitat are influencing the seasonality of parasitic infection. The prevalence of gastrointestinal parasites, the genera of helminth parasites, species and the severity of infection also vary considerably depending on local environmental conditions such as humidity, temperature, rainfall, vegetation and management practices.

Acknowledgements

The authors are indebted to Dr. N.V. Kalyankar, Principal, Yeshwant Mahavidyalaya, Nanded, for their kind help, inspiration and providing necessary laboratory facilities.

REFERENCE

Abebe, W.; Asfaw, T.; Genete, B.; Kassa, B. and Drochies, P. 1997: Comparative studies of external parasites and gastrointestinal helminthes of chickens kept under different management system in and around Addis Ababa. Revue de Medicine veterinaire, 148(6):497-500 | Anon 1994: Diseases of domestic animals caused by flukes, epidemiology, diagnosis and control of fasciola, paramphistome, dictocoelium, eurytrema and schistosoma infection of ruminants in developing countries. FAO. Report Rome, Itlay, pp. 49. | B V Jadhav, D B Bhure, Nitin Padwal and S S Nanware 2007: Studies on seasonal infection of M.armatus (Cur & Val) By Ptychobothriidae, Luhe1902. Proc. 17th All India ZSI conference, Bioinformatics, Chapter 14:125-131. | Calneck B.W., Barnes HJ. Beard C.W., McDougald L.R. and Saif Y.M. 1997: Diseases of Poultry 10th Ed. Editorial Board for the American Association of Avian Pathologists. Mosby – Wolfe. | Crofton H D 1971: A quantitative approach to parasitism. Parasitology, 62: 179-193. | D B Bhure B V Jadhav D M Pathan and Nitin Padwal.2007: Population index of some trematode parasites in freshwater fishes from Aurangabad. Proc. 16th All India ZSI conference, Fisheries and Fish Toxicology. Chapter -20: 217-229 | D B Bhure, S S Jadhav, V B Supugade A D Sawant and B V Jadhav 2007: Population Dynamics of Trematode parasites in freshwater fishes from Nath Sagar reservoir at Paithan Aurangabad District. Proc. Nat. Work. on Recent. Trends in Biotechnology. pp120-124. | D B Bhure, S S Nanware, S P Kardile and R M Dhondge 2010: A survey of the population ecology of Rhabdochona Ralliet, 1916 (Nematoda-Rhabdochonidae) from Labeo rohita (Ham. and Buch.). The Ecosphere.1(1) :12-24. | Dhanraj Balbhim Bhure, Sanjay Shamrao Nanware and Ramesh Mohanrao Dhondge 2010: Studies on population dynamics of piscian nematode Spinetectus corti Moorthy,1938 The Ecosphere 1(1):130-132. | D S Tambe, H J Wankhede and Dhole J S 2011: Prevalence of Helminthic Infection in Capra hircus L. from Ahmednagar District (M.S.). Recent Research in Science and Technology 3(3): 37-39 | Jansen, J. and Pandey, V.S. 1989: Observations on Helminth Parasites of Domestic Fowls in Zimbabwe. Zimbabwe Veterinary Journal 20 (1): 15-17. | Kennedy C R 1968: Population biology of the cestode Caryophyllaeus laticeps (Pallas, 1781) in duce, Leuciscus L., of the river. Avon. J. Parasitol, 54: 538-543. | Kennedy C R 1971: The effect of temperature on the establishment and survival of the cestode Caryophyllaeus laticeps in orfe, Leuciscus idus Parasitol., 63: 59-66. | Khater, H.F.1993: Studies on enteric helminth parasitites in domestic birds . M.V.Sc. Thesis. Fac. Vet. Med. Banha, Zagazig University. | Lowrence J L 1970: Effect of season, host, age and sex on endohelminths of Catostomus commersoni. J.Parasitol. 56: 567-571. | Nitin Padwal, Atul Humbe, Swati Jadhav and S N Borde 2011: Seasonal variation of intestinal Trichuris sp. in sheep and goats from Maharashtra State. International Multidisciplinary Research Journal 1(12):17-18 | Over H J, Jansen J and Von Olm P W 1992: Distribution and impact of helminth diseases of livestock in developing countries. FAO animal production and health paper 96. FAO of United Nation Rome, Italy, pp.221. | Patrick and Esch G W 1977: Seasonal incidence in the painted turtle, Chrysennys picta. Jr. Parasitology, 53: 818-821. | Ram Reddy G B 1980: Studies on the population dynamics of helminth parasites of certain lizards of Hyderabad .Ph.D. thesis Osmania University, Hyderabad, India. | S J Shukla, S N Borde, Atul Humbe and V V Bhavare 2012: Seasonal variation of intestinal Tapeworms in Gallus gallus domesticus at Ahmednagar region. International Multidisciplinary Research Journal 2(4):01-03. | Soulsby, E.J.L. 1982: Helminths, Athropods and Protozoa of Domesticated Animals. 7th Edition. 809 pp. Baillière Tindall, London, UK. | Susheela G 1987: Study on population dynamics of helminth parasites of rats from Hyderabad and its surroundings. Ph.D. thesis Osmania University, Hyderabad, India. |