

Original Article

Seasonal variation in the population dynamics of helminth parasites in *Gallus gallus domesticus* from Solapur and Osmanabad District (M.S) India

Asawari Fartade*, Ravindra Chati, Sandhya Salunkhe, Usha Gavhane and Anant Gaikwad

Shri Shivaji Mahavidyalaya, Chatrapati Colony, Barshi, Maharashtra 413401 India

*Corresponding Author

Dr. Asawari Fartade

Shri Shivaji Mahavidyalaya,
Chatrapati Colony, Barshi,
Maharashtra 413401 India
E-mail: alankar.fartade@gmail.com

Abstract

The present research work deals with the study of seasonal survey on the prevalence of helminth infection in *Gallus gallus domesticus* from Solapur and Osmanabad region. The study was conducted from August 2016 to July 2017. For this study Gallus were collected from different places of Solapur and Osmanabad Dist. in different season. After experimental observation the intestines of Gallus were recorded high parasitic infection during the summer season as compared to winter and monsoon.

Keywords:

Seasonal variation, Helminth parasite, Gallus gallus domesticus, Population dynamics, Solapur and Osmanabad

1. Introduction

India recorded the fastest growth rate in poultry meat production during 1985-95 with a growth rate about 18% per annum which perhaps no other country or agro industry in the world has recorded, during that period. At present more than 400 million broiler chicks are produced annually.

Village chicken production is constrained by many extrinsic factors among which malnutrition, poor management and the absence of attributed to limited housing and veterinary care services. Furthermore, poor genetic potential due to lack of selection and predation are also potential threats to productivity.

Farmers of Solapur and Osmanabad 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.

The domestic chicken feeds on a wide variety of food substance ranging from grains, fruits and insects which may harbor infective stages of parasites thereby responding them to parasitic infection particularly gastro-intestinal parasites. Helminth parasite is a major cause of the decline in health of *Gallus gallus domesticus* (delay of growth, reduced egg production, death of young birds).

2. Material and Method:

The *Gallus gallus domesticus* are collected from different places of Solapur and Osmanabad Dist. The helminth parasites were collected, preserved, processed to a permanent slide and identified under compound microscope. Drawings are made with the aid of camera lucida. The identification was made with the help of "systema Helminthum" Vol II "Helminths of vertebrates" by Yamaguti (1961)[1].

Infection of helminth parasites were determined by following formula

$$\text{Incidence of Infection} = \frac{\text{Infected hosts}}{\text{Total hosts examined}} \times 100$$

$$\text{Intensity of Infection} = \frac{\text{Number of parasites collected in a sample}}{\text{Number of infected hosts}}$$

$$\text{Density of Infection} = \frac{\text{Number of parasites collected in a sample}}{\text{Total hosts examined}}$$

$$\text{Index of Infection} = \frac{\text{No. of hosts infected} \times \text{No. of parasite collected}}{(\text{Total hosts examined})^2}$$

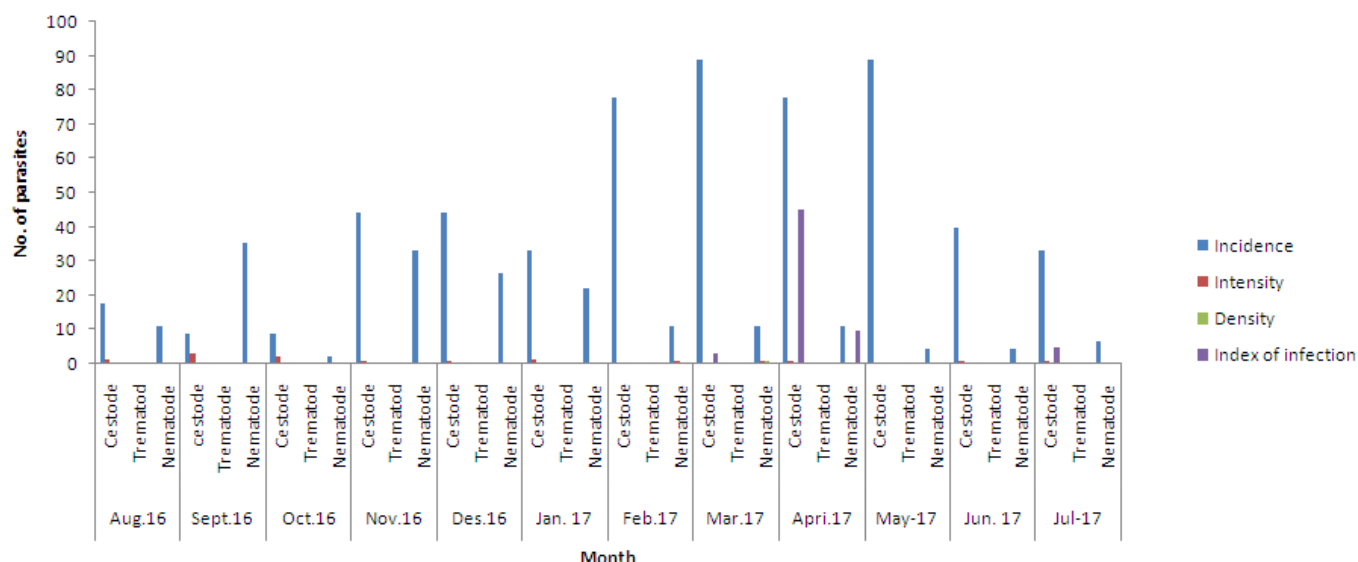
Table 1: Seasonal variation in the population Dynamics of Helminth Parasite in Gallus gallus domesticus from Solapur and Osmanabad District during the year Aug. 2016 to July 2017

Month	Name of Parasite	No Of Host examine	No of host Infected	Total No of Host Infected	Total no parasite Collected	Incidence	Intensity	Density	Index of infection	Habitat /locality
Aug.16	Cestode	45	28	8	10	17.77	1.25	0.22	0.039	Pangri
	Trematod			10	0	0	0	0	0	
	Nematode			5	1	11.11	0.2	0.22	0.002	
Sept.16	cestode	45	20	4	13	8.88	3.25	0.28	0.0256	Hipparga
	Trematode			0	0	0	0	0	0	
	Nematode			16	2	35.55	0.125	0.044	0.0158	
Oct.16	Cestode	45	5	4	10	8.88	2.5	0.22	0.019	Vairag
	Trematod			0	0	0	0	0	0	
	Nematode			0	1	2.22	0.25	0.022	0.0004	
Nov.16	Cestode	45	30	20	15	44.44	0.75	0.33	0.0003	Barshi
	Trematod			10	0	0	0	0	0	
	Nematode			10	0	33.33	0.1	0	0	
Des.16	Cestode	45	32	20	22	44.44	1.1	0.48	0.00054	Solapur
	Trematod			7	0	0	0	0.02	0	

	Nematode			12	1	26.66	0.08	0.44	0.00059	
Jan. 17	Cestode	45	25	15	20	33.33	1.33	0	0.0006	Hingani
	Trematod			0	0	0	0	0.066	0	
	Nematode			10	3	22.22	0.3	0.53	0.00014	
Feb.17	Cestode	45	40	35	24	77.77	0.68	0	0.0003	Sinakolegaon
	Trematod			0	0	0	0	0.11	0	
	Nematode			5	5	11.11	1	0.6	0.0004	
Mar.17	Cestode	45	45	40	27	88.88	0.6	0	3	Barshi
	Trematod			0	0	0	0	0.08	0	
	Nematode			5	4	11.11	0.8	0.71	0.0004	
Apri.17	Cestode	45	40	35	32	77.77	0.91	0	45	Yermala
	Trematod			0	0	0	0	0.02	0	
	Nematode			5	1	11.11	0.2	0.62	9.87	
May-17	Cestode	45	42	40	28	88.88	0.7	0	0.003	Bhoom
	Trematod			0	0	0	0	0.022	0	
	Nematode			2	1	4.44	0.5	0.002	0.0002	
Jun. 17	Cestode	45	20	18	15	40	0.83	0	0.0001	Solapur
	Trematod			0	0	0	0	0.02	0	
	Nematode			2	1	4.44	0.5	0.35	0.0002	
Jul-17	Cestode	45	18	15	16	33.33	1.06	0	5	Osmanabad
	Trematod			0	0	0	0	0	0	
	Nematode			3	1	6.66	0.33	0.02	0.00016	

Figure 1:

Seasonal variation in the population Dynamics of Helminth Parasite in *Gallus gallus domesticus* from Solapur and Osmanabad District during the year Aug.2016 to July 2017.



3. Result and Discussion

The data of seasonal variation of helminth parasites of *Gallus gallus domesticus* from different places of Solapur and Osmanabad Dist. (M.S) India observed during Aug 2016- July 2017.

The analysis of data showed that the occurrences of helminth parasites variable according to season. The high incidences, intensity, density and index of infection of all the helminth parasites occurred in summer season followed by winter season where as lower infections in monsoon season .The intensity varies greatly with respect to helminth parasites and host species, host size and feeding habitats, season and locality.

On incidences works have been done by Wunder (1939)[2], Calentine and Fredrickson (1965)[3] and Kanavev (1965)[4].

According to the Kennedy (1971, 1975 and 1977) [5,6] and Rodhe (1993)[7] the temp, humidity and rainfall, feeding habitats of host, availability of infective hosts and parasite maturation, and such factors are responsible for influencing the parasitic infections.

4. Conclusion

After the analysis of data the present study can be concluded that the high infections of helminth parasite (incidences, intensity, density and index of infection) are occurred in summer season followed by winter whereas low in monsoon season. This type of results indicated that environmental factors and feeding habitat are influencing the seasonality of parasitic infection either directly or indirectly.

Acknowledgment

One of the authors is very much thankful to the D.S.T. for providing the financial assistance under the major research project SR/WOS-A/ CS-1141/2015 and also Head Department of zoology Shri Shivaji Mahavidyalaya Barshi, (Maharashtra) for providing the laboratory facilities during this work.

References

- [1]. Yamaguti: Systema helminthium, Vol. II cestodes of vertebrates. New York London, Intersciences Publishers INC. 1961.
- [2]. Wunder: Das jahreszeitliche auftreten des bandwurmes caryophyllaeus laticeps pall in ndarm Karpfens (cyprinus carpio l.). zeitschrift fur Parasitenkunde .1939, 10, 704-713.
- [3]. Calentine, R.L and L.H. Fredickson, Periodicity of Caryophyllaeid cestodes in the white sucker *catostomus commersoni* (lacepede) Iowa. *St. J. sci*, 1965, 39:345-350.
- [4]. Kenaev, A: Advance in fish disease research *Rybov. Rybol*. 1965:4:3-4.
- [5]. Kennedy, C.R: Population biology of cestode *caryophylla ecuslaticep* (pallas, 1918) indaceleuciscus (l) of the river Avon. *J. Parasit.*, 1968; 54: 538-543.
- [6]. Kennedy, C.R: Seasonal incidence and development of cestode *Caryophylla eusleticeps* (pallas) in the river Avon. *Parasitology*. 1969,59 : 783-794.
- [7]. Rodhe: Ecology of Marine parasites 2nd edition, CAB. *International, Oxford*. 1993.
- [8]. Achainaiah. N. et al: A study on the seasonal prevalence of *Ralletina tetragona* in domestic chick (*Gallus gallus domesticus*) from Warangal region of Andra Pradesh. *IJABPT*, 2013 .4(3) 133-136.
- [9]. Akhtar et al: Prevalences of cestode parasites of domestic fowl (*Gallus domesticus*) Pakistan *Vet.J*. 1999, 19(3): 142-144.
- [10]. Anderson, R.M: Seasonal variation in the population dynamics of Caryophyllaceus. *Parasitology* 1976, 72, 281-395.
- [11]. Chubb, J.S: Seasonal occurrences of helminth parasite in freshwater fishes. Part II. Digenea. *Adv. Parasitol*. 1977, 17, 141-313.
- [12]. Fakae. B.B et al: Gastrointestinal helminth infection of domestic fowl during dry season in eastern. Nigeria. *J of African Zoology* 1991,105, 503-508.
- [13]. Sham Sul Islam AWN: prevalence of helminth parasites of domestic fowls in Zambia, *Poultry Advisor*.1985, and 18.47-51.
- [14]. Sheikh T. Salam et al:- Prevalence and pathology of *Railitina Cestcillus* in Indigenous chicken (*Gallus gallus domesticus*) in the temperate Himalayan region of Kashmir. *Veterinarski Archiv* 2010, 80 (2), 323-328.
- [15]. Senyonga, G.S.Z: Prevalences of Helminth parasites of domestic fowl (*Gallus gallus domesticus*) in Uganada, *tropical animal health and production*. 1982, 14, 201-204.
- [16]. Williams D.D: Seasonal incidences of isoglaoidacris. *Wiscon sinensis* (cestode: Caryophyllaeidea) in its fish host. Iowa state. a, *J.Res* 1978, 53 (4) 305-310.