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Seasonal variation of cestode parasite *Raillietina* in an edible bird *Gallus domesticus* (L.)

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Abstract

***Gallus domesticus* (Linnaeus, 1758) domesticated by farmers in rural areas of Nashik district of Maharashtra state. Due to uncontrolled feeding on garbage, it shows high prevalence of cestode infection, particularly *Raillietina* Fuhrmann, 1905. Authors found that prevalence is lowest in rainy season and highest in summer season, as its life cycle stages and intermediate host availability increases in winter and became adult in definitive host in summer.**

Key words: ***Raillietina, prevalence, cestode, Gallus domesticus.***

Introduction

Gallus domesticus (Linnaeus, 1758) belongs to the order Galiformes and under the family Phasianidae are poultry birds and also domesticated by farmers as subsector of agriculture. The cestode parasite *Raillietina* Fuhrmann, 1905 is very common species and play key role in development, growth and reproduction of birds. Climatic factors influence the host and intermediate host. Temperature affects controlled enzymatic metabolic activities as well as osmoregulation processes in host as well as parasites, which ultimately affects growth, development and breeding. It results mortality. The rainfall and humidity have appreciable changes on the growth of meadows and marshy green pastures and hence on the intermediate hosts. The moisture is also necessary for free stages of helminth worms. (Jadhav *et al.,* 2003). To contribute to the knowledge of domestic bird diseases in the area and to undertake improvement in traditional bird keeping, a parasitological investigation based on examining intestine and survey of cestode species was carried out for two years. Birds are characterized by relatively diverse and abundant communities of intestinal helminthes, especially cestode (Pasityte 2001). The pattern of changes in a host-parasite system is not characteristic of that particular system but changes from place to place, time to time as local conditions alter (Kennedy, 1975). According to Lapage 1996, the rainfall and temperature have a significant bearing on the stability of infection levels. The field related to incidence and intensity of nematode parasite studied by Mittal (1980). The Anderso (1976) made a valuable contribution in this field, Rajeshwar Rao (1981) on amphibians and Rama Reddy (1980) on garden lizards. For a parasite species, specializing on a single host species has important advantages. The evolution of ecological specialization in general, and host specificity in parasite has been the subject of much research over the past two decades (Adamson and Caira 1994, Thompson 1994). The significant correlation of high incidence of intermediate arthropod hosts with higher helminth infestation in chick has been found in some earlier studies too. Paulin (1999) observed positive relationship between the number of host species used and mean number of infected host positive relationships are commonly observed between the abundance of a species in a locality and frequency of its occurrence among localities on a large scale (Robert Poulin, 2004).

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Material and Methods

The survey was carried out during the period of June 2016 to May 2018, at various places of Nashik district. *viz*. Malegaon, Dindori, Manmad,

Nandgaon, Nashik, Niphad, Satana and Sinnar, Kalwan, Deola,. Fifty intestines for every month were collected and examined irrespective of their age and sex. The digestive tract of *Gallus domesticus* collected from slaughter houses.The digestive tracts was carefully examined. Cestode parasites were collected and a complete record about the infected host, parasites is summarized. The parasites were flattened and kept in 4% formalin, stained by Harris-haematoxylin, mounted in DPX and identified for further observations.

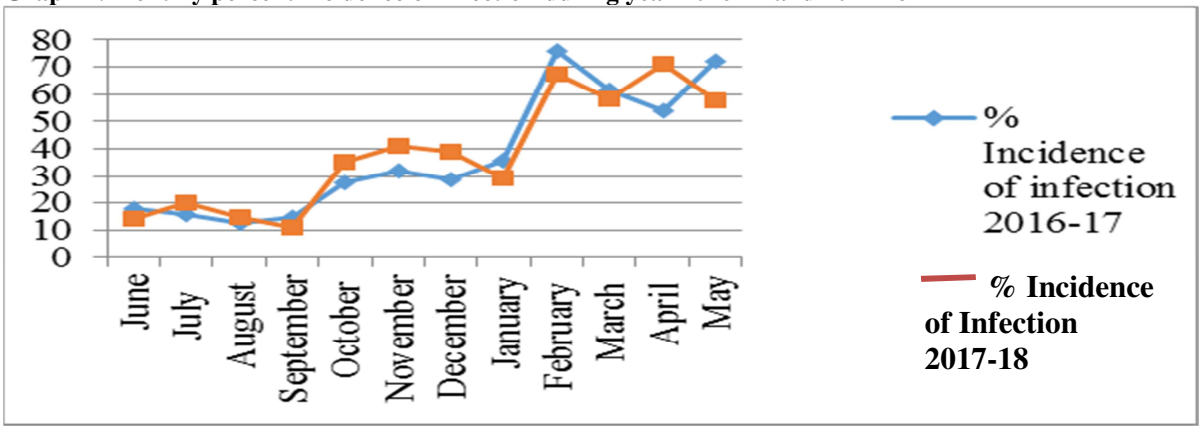
Table 1: Showing monthly % incidence of infection of the cestode *Raillietina* Fuhrmann

Month & Year of collection	% Incidence of infection	Month & Year of collection	% Incidence of infection
June 2016	18.06	June 2016	14.25
July 2016	15.79	July 2017	20.08
August 2016	12.50	August 2017	14.77
September 2016	14.58	September 2017	11.18
October 2016	27.55	October 2017	35.07
November 2016	31.75	November 2017	40.77
December 2016	28.44	December 2017	38.84
January 2017	35.48	January 2018	29.22
February 2017	75.69	February 2018	67.09
March 2017	61.33	March 2018	58.33
April 2017	53.81	April 2018	71.00
May 2017	72.00	May 2018	57.43

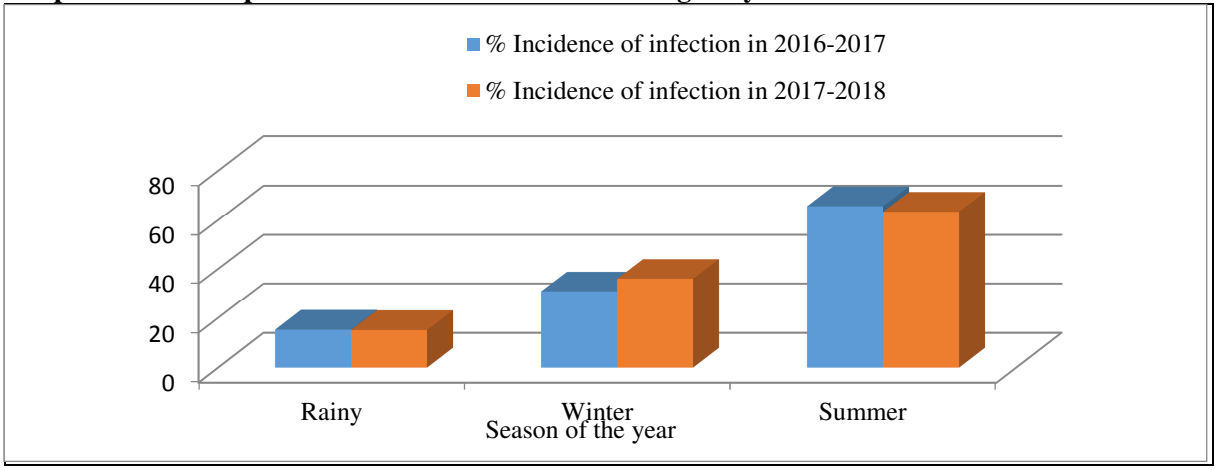
Table 2: showing seasonal % incidence of infection of the cestode *Raillietina,* Fuhrmann

Season of the Year 2016-2017	% Incidence of infection	Season of the Year 2017-2018	% Incidence of infection
Rainy	15.23	Rainy	15.07
Winter	30.8	Winter	35.97
Summer	65.70	Summer	63.46

Graph 1: monthly percent incidence of infection during year 2016-17 and 2017-18



Graph 2: Seasonal percent incidence of infection during the year 2016-17 and 2017-18



Results and Discussion

In the year 2016-2017, the incidence of infection was 15.23% in rainy season (i.e. June to September). In winter season (i.e. October to January) the incidence of cestode infection was 30.8% and in summer season (i.e. February to May) was 65.7%. The total cestode parasites collected in rainy, winter and summer season were 609, 1232 and 2628 respectively. In the year 2017-2018, the incidence of infection was 15.07% in rainy season, 35.97% in winter and 63.46% in summer season. The total cestode parasites collected in rainy, winter and summer season were 612, 1439 and 2539 respectively. It has been found that the highest incidence of infection was 65.7%. of of the cestode *Raillietina,* Fuhrmann, in the summer season of the year 2017-2018 and lowest was 15.07%., in the rainy season of the year 2017-2018. *Gallus* are domesticated as backyard chickens in rural areas which found very high prevalence and infection with multiple cestode species but comparison with other cestode species *Raillietina* was highly prevalent (Khan, 2016). So that emphasis is given on *Raillietina* sp. Gastrointestinal, meal identification and ovarian transmission studies for their potential intermediate hosts in which larval stages develops are also important research areas (Dama *et al.,* 2012). According to Mizanur *et al.,* (2018) to study the prevalence of helminths infestation, risk factors for the parasitism and the geographic distribution of helminths are needed to understand the helminth burden and guide effective prevention and control measures. As per Ananta Hembram (2015), single species and season-wise prevalence was higher in rainy season followed by winter and summer. High prevalence of Raillietina parasite is occurred in winter season followed by summer season and low in rainy season. (Shukla, 2012) but in present studies, we found that prevalence is lowest in rainy season and highest in summer season, as its life cycle stages and intermediate host availability increases in winter and became adult in definitive host in summer. The parasites were cyclophyllidean distributed mainly in the families Dilepididae, Hymenolepididae and Paruterinidae (Jean, 1994). As per Zubeda Butt, 2014 the parasitic infection may therefore be an evidence of poor management and control efforts in either the birds or in the immediate environment where infection or reinfections (directly or indirectly) originate.

Conclusions

The prevalence and seasonal variation of the cestode *Raillietina* Fuhrmann from June 2017 to May 2018 for the period of two years. From the observations, it is concluded that the infection is high in summer season, moderate in winter and low in rainy season in the host *Gallus domesticus.*

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