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Research article

A STUDY ON THE SEASONAL PREVALENCE OF *RAILLIETINA TETRAGONA* IN DOMESTIC CHICK (*GALLUS DOMESTICUS*) FROM WARANGAL REGION OF ANDHRA PRADESH.

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ABSTRACT: The prevalence of *Raillietina tetragona*, a helminth parasite was examined in domestic chick for a period of two annual cycles to determine the effects of seasonal variation on intensity and incidence of infection. The results show that the infection was more during summer followed by rainy and winter seasons. The infection was single or in association with other helminth parasites like *Raillietina echinobothrida*, *Raillietina cesticillus* and *Ascaridia galli*. The results are discussed in relation to seasonal variation. The results were analysed by student t-test ($P < 0.05$).

Key words: *Raillietina tetragona*, domestic fowl, prevalence, seasonal variation.

INTRODUCTION

Parasite represents an important component of natural community (Preston and Jhonson, 2010). Parasites have a wide impact on ecology of their hosts like health (Arme and Owen 1967) and regulation of host population (Freeland, 1979) and behavior (Millinski, 1984 and Moore, 1984). Most of the families in rural areas is associated with poultry production either directly or indirectly. Chickens are allowed to move freely in and around in surrounding areas of houses in search of food, which makes them more exposed to infections (Soulsby 1982). The helminth infection in chicken has considerable economic importance as it causes reduction in growth and weight, decrease in egg production, predation and mortality (Nair and Nadakkal, 1981 and Belghyti 2006). Minga *et al* (1989) reported an increased mortality in free ranged chicken rearing systems because of cestode infection. The life cycle of *Raillietina tetragona* requires *Tetramorium caespitum* (pavement ant), *Pheidole vinelandicum* (small black ant) and *Musca domestica* (house fly) as intermediate hosts. Recent studies indicated that the parasite and vectors are sensitive to temperature (Watson, 1999) and other climatic factors (Herell *et al* 2002) and nutrient load (Jhonson, 2007) which determines the viability and movement. Survey of literature on seasonal variation of helminth infection in vertebrates has been done in different parts of world by several workers. Effect of temperature on development (Tornquist, 1931) and growth (Esch, 1977) was studied. Variation in population dynamics was observed by Anderson (1936). Kennedy (1969) reported seasonal incidence, Kennedy (1976) and Williams (1994) examined the factors effecting the distribution of parasites in hosts. The objective of present study was to assess the seasonal prevalence of intestinal parasite *Raillietina tetragona*, Molin (1858) infecting domestic chick (*Gallus domesticus*) in Warangal region of Andhra Pradesh, India. The area under study is located 18.0°N-79.35°E in a temperate climate area, well marked with seasonal fluctuations.

MATERIALS METHODS

The investigation was carried out for a period of two annual cycles from February 2011 – January 2013. The intestines of freshly slaughtered chicken were collected throughout the year in all months and seasons from different parts of Warangal region. Soon after the collection, they were screened for *Raillietina tetragona* infection. Some of the worms were processed for taxonomic identification by following standard methods. Identification and counting was done based on morphology, number of scolices seen and the site of infection in host. Identification was carried out with the help of Systema Helminthium volume-II (Yamaguti, 1959, 1961)) and Helminths, arthropods and protozoa of domesticated animals Soulsby, (1982). The recorded data was analyzed to derive prevalence of infection and intensity of infection by using following formulae.

$$\text{Incidence of infection} = \frac{\text{Number of hosts infected}}{\text{Number of hosts examined}} \times 100$$

$$\text{Intensity of infection} = \frac{\text{No. of hosts collected}}{\text{No. of infeced hosts}}$$

RESULTS

A total of 478 and 314 birds were examined over a period of two years (from February 2011 to January 2013). Annual prevalence was recorded as 30.19% and 30.89% for the 1st and 2nd years respectively. The mean monthly prevalence was recorded as low as 9.67% (November, 2011) to as high as 56% (February 2011) and for the 2012-2013 year it ranged from 9.09 % (October) to as high as 57.14 % (July and February). The seasonal patterns was found to be highest during summer (43%) followed by Rainy (31%) and winter (15%) for 2011-2012, and similar seasonal patterns were observed for the next consecutive year *i, e* 2012-2013. It was more during summer (40.16%), followed by Rainy (37.23%) and winter (17.58%). The results are presented in table number-1 and 2. The statistical evaluation of difference between different seasons of two annual cycles was determined by t-test (with significance level of p <0.05) and was found to be significant between winter and rainy seasons only. Concurrent infections with other helminth parasites like *Raillietina echinobothrida*, *Raillietina cesticillus* and *Ascaridia galli* were also observed (Table-1, Figure-1).

Table-1: Month and season wise occurrence of *Raillietina tetragona* for the years 2011-13.

Season	Month	2011-2012			2012-2013		
		No. screened	No. Positive	%	No. Screened	No. positive	%
Summer	March	30	16	53.33	31	11	35.48
	April	27	06	22.22	28	05	17.85
	May	28	09	32.14	21	08	38.09
	June	31	07	22.58	23	08	34.28
Rainy	July	25	09	36	21	12	57.14
	August	24	08	33.33	29	09	31.03
	September	27	06	22.22	25	05	20
	October	31	04	12.90	33	03	9.09
Winter	November	31	03	9.67	27	05	18.51
	December	21	04	19.04	22	05	22.72
	January	28	12	42.85	26	10	38.46
	February	25	14	56	28	16	57.14

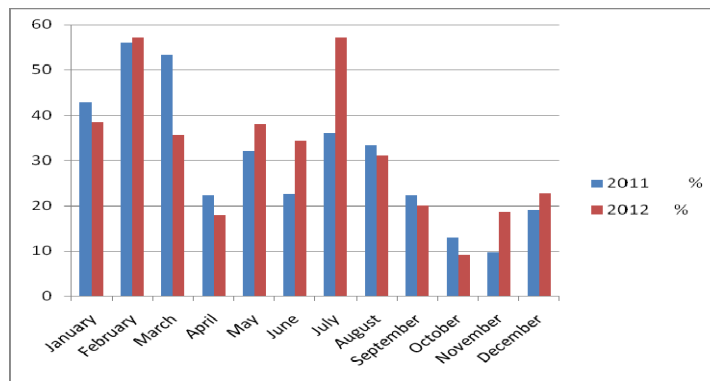


Figure-1: Histogram showing – month and season wise occurrence of *Raillietina tetragona* for the years 2011-13.

DISCUSSION

Parasites were prevalent throughout the year and in all seasons. Similar results were reported by Fothedar, Khateeb (1986), Pandit (1991), and Salam (2010). The present findings are in agreement with the earlier workers like Yadav and Tandon (1991), Akhtar *et al* (1995), Mpoame *et al* (1995), Islam *et al* (1995), Green *et al* (2009), Poulsen (2000), Salam *et al* (2010) and Koyun (2012). The high prevalence during summer finds support from the earlier reports of Mustafa Koyun (2012) and low prevalence during winter season from the findings of Marker and Rogerva (1953). Less (1962) also reported low helminth infection during December-January. However, the overall prevalence was different from some previous studies, Permin *et al* (1997), Poulsen *et al* (2000). Maguisha *et al* (2002), reported 100% prevalence of helminth infection in rural free ranging chicken regardless of sex and age. The difference may be due to different geographical areas, period of study, ambient temperature, high humidity, sample size. Establishment of worms in intestine is influenced by many factors such as age of chicken, age of infective stages, sex of chicken and diet.

Seasonal changes in mean intensity and prevalence may be due to temperature, sex, mismanagement, unhygienic conditions, parasite biology, host immunity, developmental stages of parasites, feeding habits of hosts and availability of intermediate hosts (Chubb 1963, Kennedy 1969, Pennycuick 1971, Hanzelova and Zintan 1985, Simkov *et al* 2005 and the diet (Drobney *et al* 1983).

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