

Scientific Report

Prevalence and body distribution of the poultry red mite in layer farms from Markazi province of Iran

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Summary

This study was aimed to determine abundance and body distribution of PRM in laying hens of Arak. A total of 1400 laying hens were randomly examined from January to June 2008. Of those, 26 (92.86%) layer farms were found to be infested with *Dermanyssus gallinae* (39.3%). There was significant association between prevalence and climatic conditions of the region. The most common predilection site of PRM was significantly cloak (52.7%) and the highest mixed infestation rate was 10.9% for wing-breast and cloak-breast of examined poulties. It was concluded that PRM infestation was low and predilection sites of infestation may affect egg laying capacity.

Key words: Prevalence, *Dermanyssus gallinae*, Laying hens, Arak

Introduction

The poultry red mite (PRM) is a cosmopolitan nocturnal hematophagous obligate ectoparasite of wild and domestic birds (Marangi *et al.*, 2009). Furthermore, several reports have been implicated in the transmission of human and animal pathogens such as viruses, bacteria, allergic dermatitis to farmers and veterinarians, and also parasites such as *Hepatozoon* (Valiente Moro *et al.*, 2009).

In general, the RPM infestation has been reported in those countries with high production of poultry eggs and meat (Dernburg *et al.*, 2002). In Iran, poultry production has rapidly increased as a result of low establishment cost and being a great sector in the national economy. However, only a few researches about PRM infestations in the poultry production industries of the country have been carried out (Razmi *et al.*, 2008; Tavassoli *et al.*, 2011). Nevertheless, large-scale study resulting in the diagnosis of the infestation

with PRM in layer farms from Markazi province of Iran has not yet been undertaken. Thus, the objective of the current study was to determine abundance and body distribution of PRM in layer farms of the region.

Materials and Methods

Over a six month period, a total of 1400 laying hens from 28 layer farms were randomly examined (Table 1). To detect infestation with PRM, molting feather was collected in and beneath cages and poultry body surface was investigated overnight. Birds' droppings were also collected using ten cardboard traps per each farm and then counted and scored (Nordenfors and Chirico, 2001). The specimens were digested by using KOH 10%, preserved in lacto phenol and identified at $\times 100$ magnification (Soulsby, 1982). Data were evaluated using χ^2 and t-tests with confidence interval of 95% (SPSS program). Probability of <0.05 was regarded as

significant.

Table 1: Prevalence of *Dermanyssus gallinae* in layer farms of Arak suburb

Time	No. of layer farms	No. of examined laying hens	Prevalence (n/N) (%)
Spring	14	700	41.8
Winter	14	700	36.4
Total	28	1400	39.3

Results

A total of 26 (92.86%) layer farms were found to be infested with *D. gallinae* (Table 1). There was significant difference between prevalence and mite counts (39.3%) ($P=0.001$). There was also a significant increase in prevalence in the infested birds with climatic conditions ($P<0.05$, Table 1). The layer farms management was generally good in view of traffic control and personal hygiene.

Cloak (32.7%) and wings (16.4%) were respectively the most and the fewest organs infested by PRM in laying hens of the region (Table 2). The mites' body distribution was associated with PRM densities in examined birds ($P<0.05$). Mixed infestation was the highest for wing-breast and cloak-breast in 10.9% of infested poultries. There was significant association between PRM aggregations and body surface distribution ($P<0.05$, Table 2).

Table 2: The percentage of body surface distribution of *Dermanyssus gallinae* in infested laying hens

Body distribution	Prevalence (%)	Mean±SD
Wing	16.4	7.71±2.21
Breast	20	10.78±3.16
Cloak ^a	32.7	17.87±4.24
Wing-breast	10.9	6.4±1.45
Wing-cloak	9.1	5.99±2.41
Breast-cloak	10.9	5.41±1.51
Total	39.31	9.36±4.91 ^b

a: χ^2 test ($P<0.05$), b: t-test ($P=0.001$)

Discussion

The prevalence of most parasitic diseases in domestic poultries seemed to be reduced in commercial indoor poultry production systems (Permin and Hansen, 1998). The low infestation rate of PRM in layer farms of the present study reflected the good management and characteristic of the

layer farms in the region. This finding was not in agreement with those reported from Poland with 100% (Cencek, 2003), 43.45% in northeastern Iran (Razmi *et al.*, 2008), and 30.7% in northern West Bank, Palestine (Othman *et al.*, 2012). These variations in the prevalence may be due to different factors such as layer farm sizes (Paoletti *et al.*, 2006), endemic situation (Chauve, 1998), and bad hygiene practices (Nordenfors *et al.*, 1999).

The PRM infestation was the highest in spring in the region. According to Razmi *et al.* (2008) the presence of *D. gallinae* could be linked to reduction in hygienic management of laying hens. The PRM body distribution in the current study indicated that mites' aggregation was most common in cloak. It may be due to close contact of cloak with faeces or broken eggs in cages. It was concluded that the presence of *D. gallinae* infestation with low prevalence could be of great importance if further studies plan to characterize the role of PRM on laying hens and zoonotic agents transmission in the region.

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