Original Article

Haematophagus Mites in Poultry Farms of Iran

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Abstract

Background: Blood sucking mites are important avian ectoparasites which being found on bird species worldwide. Their presence are problematic for the producers either through potential direct effects on weight gain, egg production, sperm production in roosters or as nuisance pests on worker handle hens and eggs. The aim of this study was pointing out of the status of haematophagus mites.

Methods: Eight caged layer and four breeder flocks were visited, monitoring for the presence of chicken mites performed by removing and examining debris from poultry house, infested nesting material collected into zip lock plastic bags and at least 20 birds were also randomly selected to examine the presence of chicken mites. Mites obtained from each population were mounted in Hoyer's medium on microscope slides and identified. All eight caged layer and four breeder flocks were inspected, which were infested with chicken blood feeding mites.

Results: Massive infestations of *Dermanyssus gallinae* were common with huge numbers of parasites on birds' cages and the conveyor belts for egg. Only one farm from Mazandaran Province was infested to *Ornithonyssus bursa.*

Conclusion: *Dermanyssus gallinae* was the most prevalent blood feeder mite in the breeder and caged layer flocks in Iran, while *O. bursa* was reported as a first record, which found only in a breeder flock in Mazanderan Province. It seems that its presence is limited into the area which affected by both warm and humid environmental conditions.

Keywords: Dermanyssus gallinae, Ornithonyssus bursa, *Poultry, Iran*

Introduction

The common avian ectoparasites are the blood sucking mites, which is being found on bird species world wide (Walter and Proctor 1999). These mites live on the host and within the nesting material, from where they infect and feed on chicks in the nest (Burtt et al. 1991). Blood feeder mites are from the genera *Dermanyssus (*De Geer, 1778*)* and *Ornithonyssus* (Berless1888), because of their life cycle, the population thus can become very high on birds, their presence are problematic for the producers either through potential direct effects on weight gain, egg production or sperm production in roosters or as nuisance pests on worker, particularly people handle hens and eggs (Hogsette et al. 1991). Rafie et al. (1966) indicated that poultry houses are often affected by *D. gallinae*, so far, there was not any report on *O. bursa* in Iran.

The aim of this study was pointing out of the status of haematophagus mites.

Materials and Methods

Geographical information

This study was conducted in eight caged layer (White Leghorn) and four breeder (Ross 308) farms in seven provinces (Guilan, Mazandaran, Zanjan, Ghazvin, Markazi, Ghom and Tehran) based on claiming of the farmers for presence of chicken blood feeding mite during six yr ago.

Monitoring

Monitoring for the presence of chicken mites performed by removing and examining

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debris from roosts, slats and nesting boxes, infested nesting material collected into zip lock plastic bags and at least 20 birds were also randomly selected throughout a house and examined the vent area under bright light. When large mite populations were encountered in flocks, heavily mite- infested feathers were plucked from at least 3 to 5 individual hens. The feathers were placed into plastic bags and then transported to the laboratory to confirm identification.

Species identification

Mites obtained from each population were mounted in Hoyer's medium on microscope slides and identified with the aid of key developed by Baker (1999).We did not generate data on number of mites present and therefore no analyses using density of mites could be performed. The use of presence/absence of mites was determined to be sufficient to indicate a level of parasite load that could affect the birds.

Results

All eight caged layer and four breeder flocks were inspected, found to be infested with chicken blood feeding mites. One of them was infested with *O. bursa*. It matched with the description which described by Baker (1999). The remained flocks were infested with *D. gallinae.* It can be distinguishable from *O. bursa* by the anus which is situated on posterior of the anal plate whereas in *O. bursa*, the anus is on the anterior half of this plate (Fig.1) *Ornithonyssus, bursa* (Berlese) (Arachnida: Acari:Macronyssidae) can be differentiated from *O. sylviarum* (Canestrini and Fanzago, 1877) (Mesostigmata: Macronyssidae) by the shape of its dorsal plate which gradually tapers to a blunt posterior end, in addition its sternal plate consists of three pairs of setae (Fig. 2). *Dermanyssus gallinae* was the most prevalent blood feeder mite in the breeder and caged layer in all inspected flocks, while *O. bu*rsa was reported as a first record only in a breeder flock in Mazandaran Province.

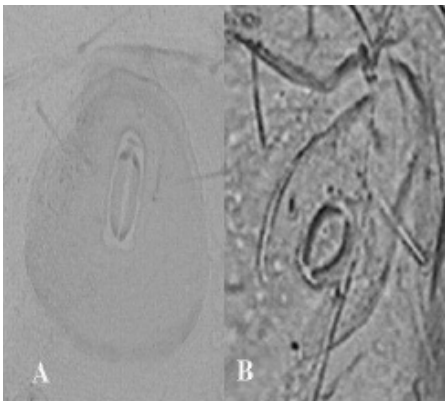

Fig. 1. Microscopic photograph showing anal plate of *Dermanissus. gallinae* (A) and *Ornithonyssus. bursa* (B)

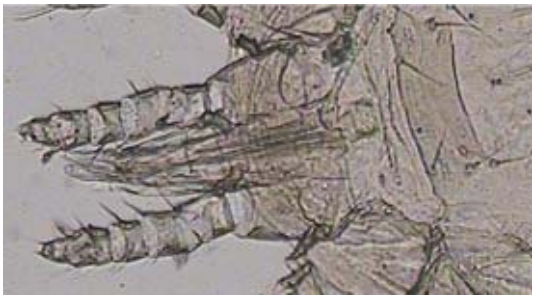

Fig. 2. Microscopic photograph showing sternal plate of *Ornithonyssus. bursa*

Discussion

Dermanyssus gallinae currently is the most important ectoparasite affecting egg layers in temperate and tropical countries, whereas, *O. bursa* is distributed throughout the warmer regions of the world (Lancaster and Meisch 1986). Rafyi et al. (1966) showed that poultry houses are often affected by *D. gallinae.* In this study, we showed the presence of *D. gallinae* in breeder and egg layer flocks and *O. bursa* only in one of the breeder flocks. Our literature research recovered no publications with record of tropical fowl mite hence it means this is the first report of this mite in

Iran. *D. gallinae* has been revealed in humid and dried area while *O.bursa* has been shown only in the north part of Iran. The tropical fowl mite (*O. bursa*) is distributed throughout the warmer regions of the world and associated mainly with poultry, pigeon and sparrows (William et al. 1976). Their presence is affected by both host and environmental conditions; being negatively correlated with the quality of an individual bird (Darolova and Schleicher 1997) and positively correlated with humidity (Walter and Proctor 1999) as well as the density of breeding sites (Poiani 1992).

The bite of haematophagus mites is irritating to man and some individuals react to the bite with prolonged itching and painful dermatitis (Burtt et al. 1991).

Besides having direct effects upon their hosts, poultry mites can transmit viral, riketsial and protozoan diseases among birds (Kettle 1995, Sonenshine 1993). *D. gallinae* has been recently reported to be an experimental vector of salmonella enteritidis (Valiente et al. 2005). It is also a vector of equine encephalitis virus among poultry (Durden 1993). Several authors showed its relationship to different poultry pathogens such as avian borelliosis, chicken pox virus, Newcastle virus, agent of pullorum disease and fowl typhoid and the agent of fowl cholera (Zeman et al.1982). *O. bursa* can spread disease even if each mite bites only a single host. This is because some disease- causing pathogens, such as avian borelliosis, can be passed vertically from a female mite to her offspring (Bowman 1995).

It can be concluded that *Dermanyssus gallinae* is the most prevalent and important pest of poultry in Iran but it seems that *O. bursa* is limited to north part of the country. Public health aspects of these parasites should be considered.

Acknowledgements

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