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Pathological Aspects of Trombidiosis in Crested Lark (*Galerida Cristata*)

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Abstract

Trombidiosis represents an ectoparasitic infestation by acarian larvae which belongs to *Trombiculidae* family that could affect different animal hosts around the world. In April 2016 in the farms around Zabol district in Southeast of Iran, 12 adult Crested Larks (*Galerida cristata*) were found with multiple bright orange nodular lesions on the skin of the neck, wings, thoracic area and the limbs. Crested lark (*Galerida cristata*) is the bird that belongs to Alaudidae family and is well represented in Europe, Middle East and Asia. The bird is usually seen on the ground near roadsides in many areas of Iran. The Trombiculid mite larva was detected in the lesions. Histopathological evaluation showed orthokeratotic hyperkeratosis, epidermal hyperplasia, hydropic degeneration and epidermal necrosis. Also, inflammatory cells penetration into the dermis was notable. The present study is the first illustration of pathological findings in the skin lesions of affected Crested Larks with *Trombicula harvest* mite.

1. Introduction

Crested lark (*Galerida cristata*) is the bird belongs to Alaudidae family that is well represented in Europe, Middle East and Asia. The adults are generally quiet and small, 17-19 cm in length and 35-50 gram in weight. The bird is usually seen on the ground near roadsides in many areas of Iran (Khaleghizadeh et al., 2005). Trombidiosis represents an ectoparasitic infestation by acarian larvae which belongs to *Trombiculidae* family. The only larval stage of 50 known species of this parasite could attack domestic animals and humans around the world (Wall and Shearer, 2001; Polina, 2012). Present study illustrates pathological aspects of infestation with *Trombiculidae* harvest mites in the Crested lark in Zabol district, Sistan and Balouches-

tan, Iran.

2. Materials and Methods

In April 2016, the present case study was conducted on 30 numbers of adult Crested Larks in the farms around Zabol region in the north of Sistan and Balouchestan province of Iran (Fig. 1). This province is located at approximately 487 m above sea level. It has a desert climate (Köppen-Geiger classification: BWh), with an annual rainfall of <7 cm and long and windy summers in which temperatures frequently exceed 42°C. Twelve numbers of investigated birds were found with multiple bright orange nodular bumps approximately 2-3 mm in diameter on the skin of the neck, wings, thoracic area and posterior part of the limbs (Fig. 1).

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The mites were collected directly and preserved in vials with ethanol 70% for identification and morphological studies with light microscope. The taxonomic key (Brennan and Goff, 1977) was used for identification and classification of the mites. For histopathological examination, skin biopsies from five of the birds were collected and fixed in 10% buffered formalin. Then, the samples were embedded in paraffin, sectioned at five μ m and were stained by hematoxylin and eosin method.



Fig. 1. *Galerida cristata* with multiple bright orange nodular lesions on the leg.

3. Results

Infected birds did not show any clinical symptoms. There was also no difference in the severity of infections and the number of lesions in the infected organs. Histopathological evaluation revealed that reaction to mites was confined to the epidermis and superficial dermis associated with orthokeratotic hyperkeratosis, epidermal hyperplasia (especially acanthosis), hydropic degeneration and epidermal necrosis (Fig. 2) and (Fig. 3).

4. Discussion

A few studies investigated integumentary lesions caused by chigger mites. Cunningham et al. (2001) described trombiculiasis cutaneous lesions in epidermis and superficial dermis of the Florida black bear that is similar to our research on Crested Lark. Although, in comparison to their report, ulceration with heterophile aggregation were not observable in the present study. Moreover, our investigation showed that the dermis was diffusely infiltrated with mononuclear inflammatory cells predominantly macrophages, lymphocytes and occasionally plasma cells and fibroblasts. These

findings are in accordance with study by Mendez et al. (2010). In another study, mix ectoparasitic infestation of the side-blotched lizard was evaluated histopathologically and in chigger mites infested cases, epidermal necrosis associated with epithelial cells hyperplasia were prominent lesions (Goldberg and Bursey, 1991). Like the present report, inflammatory cells infiltration into the dermis was noticeable in the study. Thus, the observed lesions are in accordance with our findings. However, heterophils were not found in our research. Other microscopic findings obtained from the present study are in accordance with which were described in some literatures (Little et al, 1997; Brown et al, 2006; Spieler and Linsenmair, 2016). Several researches have reported trombidiosis in various hosts (Stekolnikov et al, 2007; Gomez-Puerta et al, 2012) but there are no reports found in literature about pathological aspects of trombidiosis in Crested Lark.

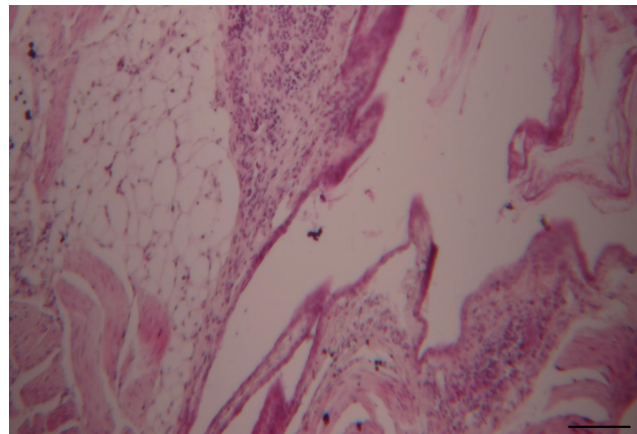


Fig. 2. Skin, *Galerida cristata*. Orthokeratotic hyperkeratosis and infiltration of mononuclear inflammatory cells into the epidermis (H&E, Bar= 100 μ m).

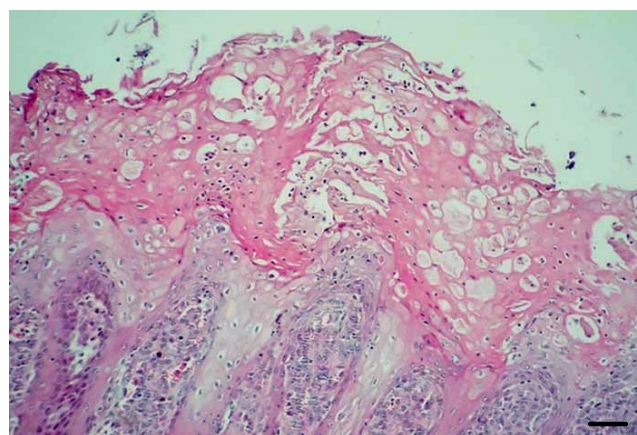


Fig. 3. Skin, *Galerida cristata*. Epidermal hyperplasia (acanthosis) and necrosis associated with hydropic degeneration (H&E, Bar= 50 μ m).

5. Conclusion

The results of this study illustrated that although, histopathological lesions of chigger mite were not at acute phase in the bird and heterophilic infiltration was not prominent but immune-inflammatory responses to the mite were significant.

Acknowledgements

The authors declare that there is no conflict of interest.

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