

## Ectoparasitic Species from Red Fox and Jackal in Western of Iran

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**Abstract:** Several canine parasites are zoonotic and are considered important to public health, particularly ascarids, hookworms, whipworms, protozoan and ectoparasite. In this study prevalence of ectoparasites in 118 samples (62 foxes and 56 jackals) investigated in Ilam province of Iran, in 2011-2012, situated in the western part of the national capital of Iran. For detecting or collecting ectoparasite the bodies of animals were combed and their skin rubbed with a piece of cotton sucked in ether to remove the ectoparasites. In case of collecting mites we had search does part of the fox and jackal body how suffering from hair loss, alopecia or swelling with the help of scalpel contaminated with oil or glycerin, the ectoparasites were separated and baggies in 75 % ethanol. Evaluation of samples indicated those 12 (19.35%) red Foxes and 10 (17.85%) Jackals were infested byat least one of the following ectoparasites. The most frequently observed ectoparasites were *Ctenocephalidescanis* (10.81%) in jackals and 12.9% in foxes. Out of 12 positive red foxes, 8 (12.9 %) were positive for fleas. The intensity of infestation showed that 2 red foxes (3.2 %) were infested by 1-5 fleas, followed by 5-10 fleas (8.06 %, n= 5) and more than 10-15 fleas (1.6 %, n= 1). Out of 10 positive red foxes, 6 (10.81 %) were positive for *Ctenocephalidescanis*. The intensity of infestation showed that 6 red foxes (10.71 %) were infested by 1-5 fleas, followed by 5-10 fleas (7.14 %, n= 4) and more than 10-15 fleas (0.0 %, n= 0). The results of the present investigation have implications for the ongoing control of parasite infestationin carnivores in Ilam province, locatedin Iran and Iraq boarder line.

**Key word:** External paerastes • Carnivorus • InfestationIlam province

### INTRODUCTION

In contrast with internal parasites of carnivores, limited data are available on the prevalence of ectoparasites on carnivore's populations in Iran. Carnivores are known to carry many species of ectoparasites such as fleas, mite and ticks, the majority of which are potentially transmissible to humans, pets and livestock. Ectoparasites are a common and important cause of pruritic and nonpruritic skin disorders in carnivores. Ectoparasites can transmit a variety of diseases and cause hypersensitivity disorders in animals. They also may cause life-threatening anemia in young or debilitated animals [1, 2]. These parasites, generally associated with dermatitis, affect animals to different degrees depending on their nutrition, immunological condition and parasite intensity and in extreme cases can lead to death [3]. Although some species of ticks and fleas can be observed, e.g., the fox tick (*Ixodescanisuga*)

and the fox flea (*Chaetopsyllaglobiceps*) mainly observed on foxes in the wild. Foxes can be infested by many other tick and flea species of their prey animals and of those living in the same environment [4, 5]. The worldwide distribution of fleas, their role as vectors for a variety of pathogens, their involvement in flea allergy dermatitis (FAD) demonstrate the need for investigations aimed at studying flea biology and epidemiology and the factors that influence their occurrence are reported by Schloderer *et al.*, Beck *et al.* and Shaw *et al.* [6-8]. The involvement of ectoparasites in several diseases in human and animals reveal the urgent need for recognizing these ectoparasites as well as their biology and epidemiology. Several studies have been published regarding distribution and prevalence of fleas, ticks, lice and mite on carnivores across the world [9-11]. Results of these studies showed that the change of parasitic infection is moderate, depending on various factors (age, locality, origin of carnivores, etc.). Considering

aspects related to public and animals' health, study of the prevalence of parasite infection in dogs should, therefore, be continuous task, with the most relevant aim being the establishment of control measures.

The present research was conducted to determine and compare prevalence and intensity of infestation of fleas, ticks, lice and mites. In addition to the geographical importance of study setting which is the borderline between Iran and Iraq, the sociological aspect was also consider as majority of people living in this area are running native animal husbandry.

## MATERIALS AND METHODS

**Study Areas:** Western Iran in general and Ilam province in particular, has unique geographical and climatic condition that supports a rich flora and fauna. Ilam province is located in western of Iran in the vicinity of Iraq country. The length of common Iran-Iraq borderline is 465 Km. Average annual precipitation of the area is less than 500 mm. The region is considered as one of the most important sheep raising areas in the country as well as one of the largest migratory sheep producer pathways. These carnivores may consume infected organs of slaughtered animals which sometimes are left behind around the non-standard abattoirs in small villages.

**Samples Collected:** In this study prevalence of parasites in 62 foxes and 56 jackals investigated in Ilam province of Iran, in 2011-2012, situated in the western part of the national capital of Iran. Most of them had been killed in traffic accidents, or shot on farms.

**Parasitological Procedure:** For detecting or collecting ectoparasite the bodies of animals were combed and their skin rubbed with a piece of cotton sucked in ether to remove the ectoparasites. In the case of collecting mites we had search does part of the red foxes and jackals body how suffering from hair loss, alopecia or swelling with the help of scalpel contaminated with oil or glycerin, the ectoparasites were separated and baggies in 75 % ethanol. The sample were proceed in lactophenol, Hoier or xylene and for conforming identification slide-mounted in Canada balsam and then examine under a binocular or high power microscopy until they were identified (male or female and species) according to the Center of Disease control (CDC) key. Red foxes and jackals ear and other body places canals were examine by bilateral otoscopic for each

animal, clinical signs of erythema, inflammation, excess debris or exudates and the visual presence of mite movement and black ceruminous exudates typically indicative of *Otodectes cynotis* recorded, swab specimen were obtained and examine microscopically. For other ectoparasites a superficial skin scraping was performed with mineral oil and a number 10 scalpel blade on the chin area of each red foxes and jackals. Each slide was completely and carefully examined microscopically. The hair was initially clipped and then a superficial skin scraping was performed. The specimen was mounted on a glass slide with mineral oil preparation [12, 5].

## RESULTS

The present study investigated prevalence of externalparasites infections in red foxes and jackals from Ilam province, Iran, from 2011-2012. Evaluation of samples indicated those 12 (19.35%) red Foxes and 10 (17.85%) Jackals wereinfested by at least one of the following ectoparasites, *Ctenocephalides canis* and *Rhipicephalus* spp. The most frequently observed ectoparasites were *Ctenocephalides canis* (10.81%) in jackals and 12.9% in foxes (Table 1).

Out of 12 positive red foxes, 8 (12.9 %) were positive for fleas. The intensity of infestation showed that 2 red foxes (3.2 %) were infested by 1-5 fleas, followed by 5-10 fleas (8.06 %, n=5) and more than 10-15 fleas (1.6 %, n=1). Out of 10 positive red foxes, 6 (10.81 %) were positive for *C. canis*. The intensity of infestation showed that 6 red foxes (10.71 %) were infested by 1-5 fleas, followed by 5-10 fleas (7.14 %, n=4) and more than 10-15 fleas (0.0 %, n=0).

One red foxes (1.6 %) were found positive for having a mixed infestation (fleas, ticks, mite), 2 red foxes (3.2 %) were positive for two type of infestation (fleas and ticks) and one Jackal (1.78 %) were found positive for having a mixed infestation.

Table1: Prevalence of ectoparasites in red fox and Jackal

	Percentage of	Infestation
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Ectoparasite	Fox (n=62)	Jackal (n=56)
<i>Ctenocephalidescanis</i>	12.9% (8)	10.81% (6)
<i>Rhipicephalus</i> spp	6.45% (4)	1.78% (1)
<i>Haemaphysalis</i> spp	0.0	1.78% (1)
<i>Ixodesricinus</i>	0.0	3.57% (2)
<i>Otodectescynotis</i>	4.83% (3)	1.78% (1)



Fig. 1: Map of study setting in bordering regions between Iran and Iraq

Note: A: Mehran area (sharing 465 Km border line with Iraq country)

B:Eyvan City,C: Shirvan Chardavol area

## DISCUSSION

The present study shows that ectoparasites are very common in wild carnivore's populations in Ilam province. According to our study, fleas were the most abundant ectoparasites, followed by ticks and mites. There are one species of fleas have been recognized including *Ctenocephalides canis* that is in agreement with study on carnivores, Iran [1, 13]. These fleas have been found to be the predominant species parasitizing wild carnivore's in several studies conducted in the Slovakia [3], Hungary [5] and Iran [13].

According to our study, after fleas, *R. sanguineus* tick dominant in red foxes and *Ixodes ricinus* in jackals were second predominant ectoparasite infestations. Similar results have been found in Lima/Peru with greatest prevalence of fleas (89.0 %), followed by ticks (30.0 %) and in Pretoria/ South Africa with *R. sanguineus* dominant ectoparasites on dogs [14,15].

The infestation appears to be associated with geographical region or could be due to interrelation of rural carnivore being used as red fox and jackal with sheep and goats in this area Ilam province. Our results show that the fox in Ilam province is a host to a wide range of parasites. Most of them are known to be present in dog and for this reason, the possibility of foxes serving as a reservoir for all the referred parasites might represent a significant risk for dogs. In addition, the environmental contamination with ascarid eggs constitutes a threat for

humans. It is concluded that a consistent programmed of sanitary education must be included public health government actions as a first step for the control of intestinal parasites in carnivores. Finally, veterinary school should emphasize the client education in training veterinarians as a means to prevent or minimize zoonotic disease transmissions

Ticks and fleas may not influence the overall condition of the red fox population in Iran directly and significantly. Nevertheless, the highly prevalent but generally low-intensity, three-host tick infestations may play a role in the transmission of several pathogens among foxes.

Limited data are available on the prevalence of this infestation in free-living red foxes and jackals in Europe; nevertheless, the prevalence of infection was low to medium (2-17%) in Austria, Czech Republic and Russia [16, 17].

In the present study, excessive cerumen was found and ear canker mites were isolated only from 4.83% of foxes and 1.78% of jackals, indicating that the prevalence of this infestation may be low in Ilam province.

Finally, it can be concluded that fox and jackal harbor several parasites, among which some are of public health importance as the larval stage of some produce economic losses in ruminant, while others can act as intermediate host or transported host for some diseases. Therefore the present study could be considered as a basis for other veterinary researches in this area.

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