

Cat and Dogs Ectoparasite Infestations in Iran and Iraq Boarder Line Area

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Abstract: Overall, 802 dog and 50 cats had no exposure to insecticide application were trapped randomly examined for ectoparasites species. A total number of 983 ectoparasites were collected. *Cetenocephalides canis* were the most predominant (28.89 %) followed by *Rhipicephalus sanguineus* (29.39 %) *Linognathus setosus* (20.57 %) *Cetenocephalides felis* (2.44 %) and *Otodectes cynotis* (1.83 %). Seasonal prevalence of ectoparasites was gradually rose in April reaching. The more frequent clinical symptoms were scratching (13.8 %) flea allergic dermatitis (13.2 %) and alopecia (7.9 %). Out of 50 tested domestic cats 29 (58%) were positive for ectoparasites. The dominant ectoparasites were fleas, mite and lice respectively. Out of 29 cats (65.51%) were positive for *Cetenocephalides felis*, (20.68%) for *Otodectes cynotis*, (6.89%) for *Felicola subrostratus*. Dog with dark or black hair had more parasitic infestation then those with white/light hair. The ectoparasite activity was observed to be higher during nights compared to day light. Dogs were kept on cement carpet were expose less then the other dog to ectoparasites how were house on soil or grass. The highest frequency of ectoparsites was found on neck of dog with 31.6%. It can be suggested that dogs and cats should be kept or housed on cement or bricks carpet. The dog's color could affect the prevalence of ectoparasites and has to be more considered too.

Key words: Flies • Ticks • Lice • Mite • Ectoparasites • Ilam

INTRODUCTION

Ectoparasites are a common and important cause of pruritic and nonpruritic skin disorders in dog and cats. 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]. However most dog and cats with ectoparasites have no clinical symptoms. Recently there has been an introduction of several new insect growth regulators, ovicidal and adulticidal products for control of flea, tick and various mite populations this has enhanced our ability to control infestation of many common ectoparasites [2].

Domestic animals such as dogs and cats are living in different geographical regions, which are threatening by several arthropods including fleas, ticks, lice and mite [3-5]. 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 [3, 6, 7]. Fleas are known to transmit the etiologic agent of bubonic plague, *Yersinia pestis*, from dogs to humans [8], transmission of the main etiologic agent of cat scratch zoonosis is reported by [9, 10], several species of rickettsia [3, 7, 9 10] and several trypanosomatids are also reported by [11, 5]. 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 dogs across the world [4, 6, 12, 13]. Due to the use of individual and environmental ectoparasite control programs in our domestic dogs and cats, information regarding the current prevalence of canine ectoparasites is difficult to obtain.

The present research was continuation of 2006 conducted study to determine and compare prevalence and intensity of infestation of flea ticks, lice and mite as well as to assess seasonal variations of infestation in Ilam province. 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. Therefore the present study could be considered as a basis for other veterinary researches in this area.

MATERIALS AND METHODS

A total of 802 dogs (shepherd, stray, house, hunting and guard) and 50 trapped cats samples were collected randomly within (January 2006 and end of December 2009) have not received veterinary care and no exposure to insecticide application were examined for ectoparasites including fleas, ticks, lice, mites. in southwest of Iran, Ilam province, (one of the most fames province of keeping large number of bovines Figure 1, Privet and governmental veterinary clinics were cooperating regarding this investigation. A questionnaire form was designed to record demographic date related to age, sex, type of breed, color, weight, address, number of dog (shepherd or guard) kept together, geographical origin, hair length, color, type of carpeting used for housing or holding or chaining the dog (place and the area keeping the dogs during rest, soil, cement, grass or breaks carpeting) clinical symptoms in related to flea allergic dermatitis, pruritus, alopecia and general appearances of the animal was recorded for each single dog and cats.

Temperature (°C) was monthly recorded. For collection of ectoparasites special tray white slippery with opening hole in the middle and jar class were fixed on this hole, dogs and cat were moved and held over this white tray. 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 dog and cats 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. All ectoparasites were counted at 40× and identified at 400×microscopically, The sample were proceed in lactophenol, Hoier or xialine 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. Dog and cats 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 *O. 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 dog and cats. 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 [2].

The Statistical Analyses System (SAS, Cory, NC, USA) was used for all analyses. All data were rested for Gaussian distribution and submitted to one-way ANOVA.

The Local Ethical Committee in Veterinary Researches as well as the Research Department in Ilam University approved the proposal of the present study.



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

RESULTS

Out of 802 tested dogs totally 355 were positive for ectoparasites (fleas, ticks, lice and mite). The dominant ectoparasites were fleas, ticks lice and mite in order respectively. Out of 355 positive dogs, 308 (86.8 %) were positive for fleas. The intensity of infestation showed that 184 dogs (59.74 %) were infested by 1-3 fleas, followed by 3-7 fleas (32.14 %, n= 99) and more than 7-10 fleas (8.11 %, n= 25). A greater abundant of fleas on shepherd dogs how were companion with herd including sheep and goats was observed (n=252, 81.81 %), followed by starry dogs (n=41, 13.31 %) and house dogs (n=15, 4.87 %). *C. canis* was the predominant species, which found on 284 dogs (92.2 %) and *C.felies* which found on 24 dogs (7.8 %), (Table 1).

Studied samples were routinely checked for clinical symptoms of ectoparasites. Overall 231 positive dogs had itching (65.1%), 49 had scratch (prurits) (13.8 %), 28 dogs were deficient for the hair or wool coat (alopecia) (7.9 %) presented flea allergic dermatitis and 47 positive dogs (13.2 %) had no any clinical symptoms. Altogether 31 dogs (8.7 %) were found positive for having a mixed infestation (fleas, ticks, lice), 12 dogs (3.4 %) were positive for two type of infestation (fleas and lice) and 4 dogs (1.1 %) were found positive only for one type of ectoparasites (mite).

The association between ectoparasites prevalence and the color of the dogs was also investigated, results showed that those animal more than half of the color of their body were dark or black color dogs (n=179, 50.4 %) were had infestation and more than one fourth of colorful dogs (n= 101, 28.4 %) and more than one fifth of white color dogs (n=75, 21.1 %) were infested with at least one type of ectoparasites. Overall, 43 dogs (12.1 %) were found to carry multi-infestations, out of them 29 dogs (67.5 %) were dark or colorful and 14 dogs (32.6 %) had white or light color.

Analysis of data related to ground (carpeting) place and housing where the dogs were kept or chained, out of 355 dogs infested with ectoparasites, 248 (69.6 %) tested positive dogs were kept on soil or grasses ground carpet place and 107 (30.2 %) were chain or kept on cement or breaks ground carpets. Results also demonstrated that those dogs who were kept on soil or grasses ground were more pronounced to ectoparasites than those who were kept on solid ground carpets.

Data on distribution of the ectoparasites on the body of the dogs showed that 112 (31.6 %) around the neck, 86 (24.0 %) on abdomen, 75 (21.2 %) on back side portion of the dogs, 62 (17.5 %) around head and ear, 11 (3.1 %) on

Table 1: Overall recovered ectoparasites on dog body in southwest Iran

Ectoparasite species	Males and females %(n)	♂♀ Sex ratio
Fleas		
Cetenocephalides canis	28.89 (284)	1: 1.75 (111 ♂ 198 ♀)
Cetenocephalides felis	2.44 (24)	1: 1.56 (25 ♂ 39 ♀)
Ticks		
Rhipicephalus sanguineus	29.39 (289)	1: 1.77(104♂185♀)
Heamaphysalis flava	6.1 (60)	1: 3.0(15♂45♀)
Lice		
Heterodoxus spindera	10.57 (104)	1: 1.47(42♂62♀)
Linognathus setosus	20.57 (204)	1: 1.147(95♂109♀)
Mite		
Otodectes cynotiscanis	1.83 (18)	1: 2.0(6♂12♀)
Total	100.0 (983)	(398♂650♀)

♂M:♀F, Male/Female

Table 2: Comparison of monthly bases prevalence ectoparasites infestation and maximum, minimum temperature, in Ilam province

Month	Positive dogs (n)	Temperature °C	
		Maximum	Minimum
January	3	17	3
February	5	19	6
March	9	20	8
April	14	23	12
May	21	26	14
Jun	51	34	19
July	81	38	27
August	71	35	26
September	44	32	21
October	31	30	18
November	17	24	11
December	8	19	6

Table 3: Overall recovered ectoparasites on cats body in southwest Iran

Ectoparasite species	Males and females %(n)	♂♀ Sex ratio
Fleas		
Cetenocephalides felis	73.07 (38)	1: 2.14
Lice		
Felicola subrostratus	11.53 (6)	1: 1.65
Mite		
Otodectes cynotis	15.38 (8)	1: 1.12
Total	100.0 (52)	

♂M:♀F, Male/Female

chest of the dogs and 8 (2.3 %) on hands and legs cases of at least one type of ectoparasites infestation on the different section of dogs body were seen.

The movement of the ectoparasites was also controlled during both day and night times. The activity of fleas, ticks, lice and mite were seen to be more in night than the daytime.

The assessment of ectoparasites during different season of the year and temperature was showed that seasonal variation of ectoparasites throughout the year gradually rose from April, reaching to maximum in July and then dropped gradually with onset of winter (Table 2).

Out of 50 tested domestic cats, 29/50 (58%) were positive for ectoparasites (fleas, lice and mite). The dominant ectoparasites were fleas, mite and lice respectively. Out of 29 positive cats, 19/29 (65.51%) were positive for fleas. The intensity of infestation showed that 8/19 cats (42.1 %) were infested by 1-3 fleas, followed by 3-7 fleas (31.57 %, n= 6/19) and more than 7-10 fleas (26.31 %, n= 5/19). Otoscopic examination of both ears revealed mite movement and black ceruminous exudates typically indicative of the presence of *O. cynotis* in 6/29 (20.68%) of the cats. Out of 29/50 were positive for ectoparasites, 4/29 (13.79%) were positive for *F. subrostratus*. Overall 11 cats (37.93 %) were found positive for having a mixed infestation (fleas, ticks, lice), 14 cats (48.27 %) were positive for two type of infestation (fleas and lice) and 4 cats (13.79 %) were found positive only for one type of ectoparasites (mite) (Table 3).

DISCUSSION

According to other findings in Iran, dogs and cats and other carnivores (such golden jackal, red foxes and cats) can reservoirs for ectoparasites, helminthes and protozoan parasites [14-17].

The present study showed that fleas were the most abundant ectoparasites. There are two species of fleas have been recognized including *Ctenocephalides canis* and *Ctenocephalides felis*, that is in agreement with study on other carnivores, Iran [16, 17]. These fleas have been found to be the predominant species parasitizing dogs and cats in several studies conducted in the United Kingdom [18, 19] and Greece [20]. The *C. canis* dominant fleas reported in these studies are consistent with those who already reported in Austria [21], Ireland [22] and New Zealand [23]. Some studies have found the *C. felis* as the most prevalent species, with abundant values up to 92 % in Florida /USA [24], in Virginia/USA [25], in Wisconsin/USA (Amin., 1976), in Egypt [26] and in Lima/Peru [27]. The *C. felis* recorded in this study was the second most abundant flea demonstrated.

This study found that female ectoparasite was predominant than male, the reason for this discrepancy is unclear but may be in part related to the fact that females have longer life than males and that males are spending more time off the host or they are more prone to predation or grooming by the host, or due to starvation [28, 29]. Female abundant infestation has also been reported by other researchers [18, 30, 31]. According to our study after fleas, tick *R. sanguineus* dominant and *H. flava* were

second predominant ectoparasite infestations followed by lice with two species' *Heterodoxus spindera* dominant and *Linognathus setosus* in dogs and *F. subrostratus* in cats and than mite with one species *Otodectes cynotis* (Tables 1 & 3). Similar results have been found in Lima/Peru with greatest prevalence of fleas (89.0 %), followed by ticks (30.0 %), [27] and in Pretoria/ South Africa with *R. sanguineus* dominant ectoparasites on dogs [32].

Clinical symptoms deficiency of the hair or wool coat (alopecia), itching, scratches (pruritus) and flea allergic dermatitis found in this study are also consistent with recent report in Greece [20]. However, fleas on dog can also cause other disorders such as flea-bite dermatitis and other allergic reactions [33, 34, 35].

Ectoparasites occur over all seasons in Ilam region southwest Iran, representative long distance (465 KM) border with Iraq country (Table 2 & Figure 1). Similar results have been reported in southern Italy [4]. In the present study, the highest ectoparasite infestation recorded in June, peaked in July to October with a maximum temperature of 38°C. Similar results have been reported in Germany, where the highest prevalence of ectoparasites in dogs were detected between June and August [7] and in Italy [4] in which the peak was recorded between June and October. In Dublin/Ireland, *C. canis* was the most predominant on dogs from September to March with a peak in October [35]. In Mexico, no significant seasonality association was recorded for *C. canis* or *C. felis* on dogs but infestations of both species were higher in spring, summer and autumn than winter [36]. This differences could be due to geographical regions. In the present study the most frequency of ectoparasites was found on neck of the dogs (31.6 %), which is consistent with the previous report [4].

As a conclusion: fleas, ticks, lice and mites were the widespread ectoparasites of dog and cats in southwest Iran, Ilam with infestation found in 355 of 802 dogs investigated. The major flea species was *C. canis*. Ticks species was *R. sanguineus*, lice abundant species collected was *L. setosus* and the species of mite was *O. cynotis*. Data collected in this study showed dogs with dark or colorful hair were more expose to ectoparasites and follow the data analyses show the dogs were kept, hold or housed on soil or grasses ground place were more pronounced to fleas, ticks, lice or mites. The infestation appears to be associated with geographical region or could be due to interrelation of rural dogs being used as shepherd dogs with sheep and goats in this area Ilam province.

C. canis and *C. felis* should be given fully consideration particularly in future researches in terms of controlling programs. It can be suggested that dogs should be kept or housed on cement or bricks carpet. The dog's color could affect the prevalence of ectoparasites and has to be more considered too.

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