

## **DISTRIBUTION OF ECTOPARASITES INFESTED SHEEP AND GOATS IN DUHOK PROVINCE, NORTH IRAQ.**

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### **ABSTRACT**

An investigation into ectoparasites of sheep and goats was carried out in Duhok province North West region of Iraq, during six months of a year, from January to June 2010. One thousand and two hundred forty eight (1248) sheep and 954 goats in 110 flocks from 80 villages were examined. Among them overall animals (66.89%) were infested with one or more species of ectoparasites. Of 720 (57.7%) and of 753 (78.9%) sheep and goats, respectively were infested. Five different types of ectoparasites, ticks (46.7%, 34.9%), lice (3.8%, 33.8%), mites (7.1%, 0.1%), fleas (2.8%, 7.75%) and ked (1.2%, 4.5%) were identified sheep and goats, respectively. Five species of hard ticks (Ixodidae) were identified in both sheep and goats, namely *Hyalomma anatolicum anatolicun* (48.37%, 13.5%), *H. marginatum* (18.01%, 8.1%), *Rhipicephalus sanguineus* (21.09%, 39.93%), *R. turanicus* (16.8%, 49.54%) and *Haemaphysalis ssp.* (2.5%, 0.9%). Two species of lice were infested each one of animal these namely, *Damalinia Ovis* (75%) and *Linognathus stenopsis* (33.3%) on sheep, and *D. caprae* (80.74%) and *L.stenopsis* (19.2%) on goats. Sheep were highly infested with two species of mites, *Sarcoptes scabiei* (25.84%) and *Psoroptes Ovis* (74.15%) than the goats, which one goat was found (0.1%) infested with *S. scabiei*. Three species of fleas were found infested both sheep and goats. Out of 106 collected fleas (47.2%, 43.4%, 9.4%) were *Ctenocephalides felis felis*, *Pulex irritans* and *Xenopsylla cheopis*, respectively. However, the only one species of Ked *Melophagus ovinus* were infested (1.2%) of sheep and (4.5%) of goats.

### **INTRODUCTION**

Animal resources, comprise of sheep, goats and cattle numbers of these animals in Duhok governorate north west of Iraq amounted by 514682 sheep (Karadi, Awasi and Hamadani) breeds and the black mountaineering goat 25865 the widely spread sort in the area. The basic purpose of this resource is to produce meats, dairy, wool and leathers.

The arthropods contain over 80% of all known animal species and occupy almost every known habit, as well as a plethora of small and little known groups. As a result of their activity, arthropod ectoparasites may have a variety of direct and indirect effects on their hosts (1).

Arthropod pests limit production in the sheep and goat industry in many ways. External parasites feed on body tissue such as blood, skin and hair. The wounds and skin irritant produced by these parasites result in discomfort and irritation to the animal. Parasites can transmit diseases from sick to healthy animals. They can reduce weight gains and milk production in general infested livestock cannot be efficiently managed to realize optimum production levels ( 2). All ectoparasites causes intense irritation to the skin and skin damage, blood loss and severe anemia, moreover they are important vectors of protozoan, bacterial, viral and rickettsial diseases (3; 2).

Research on the ectoparasites has been ignored in north of Iraq. It has long been in 1957 and 1966 two reports submitted to Iraq government by (4 ; 5) respectively about outline on a survey of parasites and their control. Therefore the objective of the current study is to estimate the prevalence and to identify the distributed species of sheep and goats ectoparasites in Duhok province north Iraq.

## **MATERIALS AND METHODS**

### **Meteorological Data**

The main rainfall, daily ambient temperature and relative humidity were recorded by local meteorological station. The rain full in Duhok province occurred usually during winter and spring and ranged between (89-415mm). The temperature varied between (12-45C°) and RH was never less than 44%.

### **Sample collection**

This study was carried out on 1248 sheep and 954goats from 85 villages, And 110 flocks from January – June 2010 at Duhok province. This province covers an area 9754 km<sup>2</sup> at North West of Iraq, near to border to Turkey (north) and Syria (west).

The collection was made two visits per week and 20-30 samples were taken at each visit. The head, ears, eyelids, axilla, perineal region and udder, teats (female), and scrotum (male) and all entire of body of individual animal was inspected for presence of ectoparasites like (tick, louse, fleas, ked, burrowed larva of insects). All visible adult, larvae, nymph of ticks and lice, kids were picked up by using a fine forceps, and to ensure that the mouth parts of ticks were not left behind embedded tissue. Living ticks were removed most effectively by dipping the tick and surrounding skin with 70% ethyl alcohol, and enclosed in screw cap tubes containing 70% alcohol as perseverate. The adult louse, Kid and fleas collected by catching in individual with thumb forceps and kept in glass tubes with ethyl alcohol 70%.

When any skin lesions scrape like was observed. The skin scraping was taken by using the method described by (6). Deep skin scraping is one the most diagnostic tools used in evaluating animals with dermatological problems. Before the skin was scraped the blade was dipped in a drop of mineral oil on the slide, during the scraping process 6-8cm<sup>2</sup> was scraped. Upon clinical finding, the skin was scraped for mites that lived in tunnels (e.g. Sarcoptes species) until capillary ooze blood occurred from the area.

The most practical means of detecting lice were generally inspected of sheep with primary samples unite of animals and secondary units of fleece pertaining to multiple body sites and collecting the lice from the body regions (head, neck, flanks, front, ear, legs and belly) .(7;8;9;1).

All samples a properly labeled and brought to Faculty of Veterinary Medicine for examination and identification.

### **Laboratory Examination**

The collected samples were transported to the laboratory and examined under stereomicroscope for identification .Following the identification key given by (11),and (10); (12) for ticks which depending on morphological characteristics ,like size, length and shape of basis of capitulum, orientation, shape and segmentation of the pedipalp, shape of hypostome, presence of eyes or eyeless, has festoons, length of scutum, punctuation; length and depth of the cervical groove; colour of legs; shape of the spiracles and situation of the anal groove.

For mite, deep skin scraping examined by method of skin concentration method, which described by (13). The samples mixed with 10 volumes of 10% KOH solution o one volume of sample in test tube and heated, cooled and centrifuged at 3000 rpm for five minutes and discarded supernatant and loop full sediment examined on clean slide covered with clean cover slip. The identification of mites depending on specificity of the host and morphological characteristics which described by (12).The shape of the body, length of the legs, and shape tarsal sucker; shape and segment action of pedicles. The louse in general is highly host specific and classification depends on shape of head, antenna and maxillary palps and tarsi with single claw; and present or absent para tergal plates and setae of abdomen. The sample of leas specified morphologically according to the method described by (14) depending on present o absent ctenidia (combs) and shape of frons.

## **RESULTS**

The overall prevalence of ectoparasites was infested small ruminants. From 2202 animals, which comprised (1248 sheep and 954 goats) of 1473 (66.89%) were infested with various types of ectoparasites. Of 720(57.2%) sheep and753 (78.9%) goats were infested with one or mostly mixed infestation of ectoparasites in both species. The major ectoparasites indentified on sheep were, hard ticks 583(46.7%), lice 48(3.84%), mites

89(7.13%), fleas 35 (2.8%), and sheep keds 15(1.2%). For the goats these were hard ticks 333(34.9%), lice 322(33.75%), mites 1(0.1%) fleas 74(7.75), sheep keds 43(4.5%). (Table1). For both species, ticks were the most common ectoparasites (66.89%), while the least common was ked in sheep (1.2%) and mites (0.1) in goats.

Table-1-Prevalence of ectoparasites infested sheep and goats in Duhok/Iraq.

Animal species	Number of animal examined	Number Positive (%)	Number Of ectoparasites and (%)				
			Tick	Louse	Mite	Fleas	Ked
Sheep	1248	720 (57.7)	583 (46.71)	48 (3.84)	89 (7.13)	35 (2.8)	15 (1.2)
Goat	954	753 (78.9)	333 (34.9)	322 (33.75)	1 (0.1)	74 (7.75)	43 (4.5)
Total Overall	2202	1473 (66.89)	916 (41.59)	370 (16.8)	90 (4.08)	109 (4.95)	58 (2.63)

Five species of three genera of hard ticks (Ixodiidae) were infested in both sheep and goats. The common species were *Hyalomma anatolicum anatolicum* 282/583(48.37%) on sheep and 45/333(13.51%) on goats, *H. marginatum* 105/583(18.01%) on sheep, 27/333 (8.1%) on goats, *Rhipicephalus sanguinaus* 123/583(21.09%) on sheep, 113/333(49.54%) on goats, and *R. turanicus* 98/583(16.8%) on sheep, 165/333(49.54%) On goats, and *Haemaphysalis ssp.* 15/583/(2.57%) on sheep,3/333(0.9%) on goats (Table2). The common species infested sheep was *H.a anatolicum* and the least one *Haemophysalis ssp.* In both sheep and goats, while *R. turanicus* the high prevalent in goats.

Table-2- Prevalence of hard tick infested sheep and goats

Animal species	Animal infested	<i>Hyalomma</i>		<i>Rhipicepholus</i>		<i>Haemaphysalis spp.</i>
		<i>H.a anaticum</i>	<i>H.marginutu m</i>	<i>R.sanguinous</i>	<i>R.turanicus</i>	
Sheep	583	282 (48.37)	105 (18.01)	123 (21.09)	98 (16.8)	15 (2.57)
Goat	333	45 (13.51)	27 (8.1)	113 (39.93)	165 (49.54)	3 (0.9)

Prevalence of Lice infested sheep and goats. Both biting and sucking lice were infested sheep and goats. Out of 48 sheep infested with lice and 36(75%) of sheep infested with *Damalinia ovis* and 16(33.3%) with *Linognathus stenopsis*. and 8(16.66%) of sheep were infested with both species. Whereas, out of 322 infested goats, 260(80.74%) goats were infested with *D. capriae* and 62(19.2%) infested with *L. stenopsis* and 71(22.07%) goats were infested with both species (Table3).

Table-3-

Animal species	Number of infested	<i>Damalinia</i>		<i>Linognathus stenopsis</i>	<i>Mixed</i>
		<i>D.ovis</i>	<i>D. capriæ</i>		
Sheep	48	36 (75)	—	16 (33.3)	8 (16.66)
Goat	322	—	260 (80.7)	62 (19.25)	71 (22.05)

The skin scraping revealed that the two species of mites were infested sheep. Out of 89 of sheep infested 66(74.15% ) and 23(25.84%) were infested with *Psorobtes ovis* and *Sarcoptes scabiei* respectively and 12(13.48% ) of sheep infested by mixed species. However, one species of *Sarcoptes scabiei* was infested only one goat (Table4).

Table-4- Prevalence of mites infested sheep and goats.

Animal species	Number of infested	<i>Psoroptes ovis</i>	<i>Sarcoptes scabiei</i>	<i>Mixed</i>
Sheep	89	66 (74.15)	23 (25.84)	12 (13.48)
Goat	1	—	1 (100)	—

Three species of fleas were found infested 35(2.8%) of sheep and 74(7.75%) of goats. A total of 106 collected fleas from both animals. Of 50(47.2%) were *Ctenocephalides felis felis*, 46(43.4%) *Pulex irritans* and 10(9.4%) *Xenopsylla cheopis* (Table 5).

Table-5- Prevalence of fleas infested sheep and goats.

Species of fleas	Number of infested sheep and goat	%
<i>Ctenocephalides felis felis</i>	50	47.2
<i>Pulex irritans</i>	46	43.4
<i>Xenopsylla cheopis</i>	10	9.4
<b>Total</b>	<b>106</b>	<b>100</b>

However, the only one species of ked *Melophagus ovinus* was infested 15(1.2%) sheep and 43(4.5%) goats (Table1).

## DISCUSSION

This preliminary review is intended to outline the basic feature of the ectoparasites. The results of this study not compared and contrasted due to lack of relevant literatures about general ectoparasites. However, this study assumes and considers the first scare report deals in details on the distribution and occurrence of ectoparasites infested small ruminant mainly on sheep and goats in Duhok .Iraq area. The results of current study indicated that the sheep and goats are very susceptible to different ectoparasites infestation.

The overall collectively prevalence of most ectoparasites in sheep and goats was (66.8%). It was (57.7%) in sheep and (78.9%) in goats. This study revealed one or more types of ectoparasites infested on sheep and goats. These were ticks (46.7%), (34.9%); lice (3.84), (33.75%); mites (7.13%), (0.1%); fleas (2.8%), (7.75%); ked (1.2%), (4.5%) on respectively. Only one report was recorded the most of them in livestock animals from Iraq (4) except fleas. At other elsewhere of the world, the studies on ectoparasites have been done. (15) on an across-sectional study they found the overall prevalence of ectoparasites in sheep and goats at Tigray region, Ethiopia was (54.8%). The major identified ectoparasites in sheep were ticks (48%), lice (6.17%) and fleas (3.1%). (2) identified ectoparasites infested sheep were ticks (40.7%), fleas (22%), lice (9.8%) and mites (17.6%); and in goats were ticks (31.5%), fleas (228%), lice (26.2%) and mites (19.5%) in Makurd, North central Nigeria.

Ticks were the major ectoparasites encountered in both sheep and goats in the current work. Five species of hard ticks were identified infested, namely *Hyalomma anatolicum anatolicum* (48.3%), (13.5%); *H.marginatum* (18.01%), (8.1%); *Rhipicephalus sanguinus* (21.09%), (39.9%); *R. turanicus* (16.8%), (49.5%) and *Haemaphysalis spp.* (2.5%), (0.9%) on sheep and goats respectively.

Mostafa ( 2011 ) four species of ticks were *Hyalomma anatolicum anatolicum*( 51.9%), *H.marginatum* ( 10.4% ),*Rhipicephalus sanguinus* ( 7.7%) ,*R. turanicus* (30% ) .Rasmi et al (2003) identified five species of ticks from sheep and goats *Rhipicephalus sanguinus*, *Hyalomma anatolicum* most common and other species encountered *Hyalomma anatolicum anatolicum*.*H.asiaticum* on sheep in Iran. However Nasiri et al (2010) identified two genera were *Hyalomma* and *Haemophysalis* and five species including *H.marginatum* (44.67%) *Hyalomma anatolicum* (43.1%),*H.asiaticum* (6.37%), *H.dromdareii* (5.55%) and *H.sulcata* (0.24%) from Ilam province. Iran.

Two species of mites were infested sheep in the present study. The species were identified *Psoroptes ovis* and *Sarcoptes scabiei* (74.15%), (25.84%) respectively.

Only one species *Psoroptes ovis* was infested goats in very low prevalent rate (0.1%). Members of the genus *Psoroptes* cause scab mange in a number of live stock mammals especially sheep, cattle, goats, rabbits, water buffalo, horses, donkeys and mules. The mange mite (*Sarcoptes scabiei*) is important cosmopolitan parasites of many domestic mammals causing Sarcoptic mange (19; 20; 21). (22) found (2.6%) of sheep were infested by *S. scabiei*.

The prevalence of lice infested on sheep and goats were *Damalinia ovis* (75%) on sheep and *D. capree* (80.7%) on goats, while species *Linognathus stenopsis* were (33.3%) and (19.25%) on sheep and goats, respectively. Yakh chali and Hosseine (2006) recorded (67.5%) on sheep and (71.4%) on goats were infested with lice. These were *D.ovis* (58.8%) and *D. caprae* (71.4%) on sheep and goats respectively, *Haematopinus* species on sheep (76.6%) and on goats (62.2%) *Linognathus stenopsis* (36.1%) and *L. ovillus* (29.4%). (23) identified two species of lice *D. caprae* (20.8%) and *Linognathus stenopsis* (18.4%) infested on black goats in Bangladesh.

Three species of fleas were indentified in this study infested sheep and goats (Table 5). Perhaps the most wide spread and pestiferous fleas associated with mammals is the cat flea ( *Ctenocephalides felis felis* ) (47.2%). Although this flea is most common on cats and dogs, where levels of infestation can be extremely high *C.felis* will also feed on humans, goats, sheep, equid and other host (24). Many flea species are occasional biters of domestic animals.

Some of these fleas- such as certain members of genera *Citellophilus*, *Ctenophelids*, *Ctenophthalmus*, *Nosopsyllus*, *Oropsylla*, *Pulex* and especially *Xenopsylla* ( 21). *Ctenocephalides felis, felis* comprised of all the fleas collected (16.8% of goats and 13% of sheep in Urmia. Iran.(22). One hundred fifty six specimens of pulex irritans were collected from sheep and goats, cattle, chicken and human which consisted of 92.8% of all recovered fleas (25).

The sheep ked *Melophagus ovinus* was observed in this study. On sheep (1.2%) and (4.5%) on goats infested, the Abebe, et al., 2011 also recorded this ked infested on sheep (6.7%) only in Ethiopia.

The highly distribution of different ectoparasites infested the sheep and goats and their high encountered in this study. That indicated there are not appropriate and strategic control measurements applied by animal health service. Also control of external parasites in many countries of the world becomes less reliable because, many acaricides are so expensive, toxic and resistance has developed to many of them. And also, regarding to animals movement and quarantine are not strictly enforced. Breeding methods of the area is primitive relies on natural grazing grounds in the best years season and also, animal lodging is primitive and out of hygienic conditions most lodgings are built out of mud or stones.

### توزيع الطفيليات الخارجية الخراف المصابة والماعز في محافظة دهوك، شمال العراق.

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#### الخلاصة

اجريت دراسة على الطفيليات الخارجية على الأغنام والماعز في محافظة دهوك المنطقة الشمالية الغربية من العراق، خلال ستة أشهر من كل سنة، خلال الفترة من يناير حتى يونيو 2010. تم فحص ألف و 248 (1248) الأغنام والماعز 954 في 110 قطعان من 80 قرية. وكان من بينهم الحيوانات العام (66.89%) التي تنتشر فيها مع واحد أو أكثر من الأنواع من الطفيليات الخارجية. وكان من 720 (57.7%) و من 753 (78.9%) الأغنام والماعز، على التوالي التي تنتشر فيها. خمسة أنواع مختلفة من الطفيليات الخارجية، والقراد (34.9%)، قمل (3.8%)، العث (7.1%)، البراغيث (2.8%)، ورطة (1.2%)، وقد تم تحديد الأغنام والماعز، على التوالي. وقد تم تحديد خمسة أنواع من القراد الصلب (Ixodidae) على كل من الأغنام والماعز، وهي الزجاجي العين الأناضولي (48.37%)، H. hamshii (18.01%)، H. anatolicun (13.5%)، H. turanicus (16.8%)، و القرشومة SSP. sanguinaus مروحية الرأس (21.09%)، R. (39.93%)، و القرشومة SSP. (2.5%)، وكانت نوعين من القمل التي تنتشر فيها كل واحد من هذه الحيوانات وهي القرودة الغنمية (75%) والنمنمة stenopsis (33.3%) في الأغنام، ودال العنزية (80.74%)، و L. stenopsis (19.2%) في الماعز. وكانت الأغنام التي تنتشر فيها للغاية مع نوعين من العث، القارمة الجربية (25.84%)، والغنمية القارشة (74.15%) من الماعز، والذي وجدت واحدة الماعز (0.1%) تعج الجربية س. تم العثور على ثلاثة أنواع من البراغيث المصابة على حد سواء الأغنام والماعز. من أصل 106 البراغيث التي تم جمعها (47.2%)، (43.4%)، (9.4%) وكانت رأسي الأمشاط الهريية، المهيجة البرغوث والأصلم الخوفي، على التوالي. ومع ذلك، كان فقط نوع واحد من ovinus لأكعة المواشي المصابة رطة (1.2%) من الأغنام و (4.5%) من الماعز.

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