

Epidemiological and identification study of mange mites infestation in sheep in Al-Diwaniyah province

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Abstract

This study was conducted to investigate the percentages of infestation of mange Mites in sheep in different regions of Al-Diwaniyah province and the effects of age, sex of animals on the prevalence of the disease were studied also. The results of the microscopical examination of the skin scraping were revealed that 186 of the sheep were infested with mites with an overall percentage of infestation 3.65%. In this study four genera of Mange Mites were recorded that parasitized sheep: *Sarcoptes scabiei*, *Psoroptes ovis*, *Chorioptes* spp., *Chirodiscoides caviae* (fur mite) with rates 31.18%, 52.15%, 8.06%, 2.15% respectively where the genera of *Chorioptes* spp. and *Chirodiscoides caviae* recorded for the first time in Iraq, in addition to the presence a mixed infestation such as *Sarcoptes* with *Psoroptes* 5.91% and *Psoroptes* with *Chorioptes* 0.53%. The prevalence of the infestation was highest in sheep more than two years old (3.74%) and the lowest in sheep with age less than two years old (3.40%). The prevalence of Mange Mites in male sheep was 3.93% versus 3.59% in females. Statistically there were no significant differences ($P > 0.05$) according to the age and sex of animals, but the differences in percentages of infestation were significant ($p < 0.05$) according to different regions of study.

Introduction

Humans have known Mites for along time. The Greeks referred to Acari which meant mites but they remained unknown until the beginning of the 17th century. The researches and studies since that time indicated the presence of various species of this organism parasitizing on vertebrate and invertebrate animals as ectoparasites or endoparasites(1). Ectoparasites are ubiquitous, often highly damaging and in most cases cannot be permanently eradicated; hence, they must usually be managed locally with insecticides, some ectoparasites also act as vectors of protozoa, bacteria, viruses, cestodes and nematodes. The behaviour of ectoparasites also may cause harm indirectly, causing disturbance, increasing levels of behaviour such as rubbing, and leading to reduced time spent grazing or ruminating and in some cases to self wounding (2). Mange is a contagious skin disease characterised by crusty, pruritic dermatitis and hair/feather loss, and caused by a variety of Mange mites which are mostly weakly sclerotised,

slow-moving, very small (100–900 μm), and live permanently on their hosts burrowing in or living on the skin. The French term for mange is 'la gale', and in English, it has been called 'itch', 'scab', or 'scabies'. Numerous species of mites cause mange specifically on domestic hosts (livestock, poultry). About 50 mite species in 16 families and 26 genera may cause mange where all the major mange mite species are within the orders Astigmata and Prostigmata. The Astigmata include the medical or veterinary important families Sarcoptidae and Psoroptidae which include *Sarcoptes* mite that causes sarcoptic mange (scabies) in humans and other mammals as a zoonotic disease(3). The main objectives of this study were to isolate and diagnose species of mites that cause mange in sheep and determine the prevalence of the disease in the different regions of AL-Diwaniyah Province and study the effect of the age and sex on the prevalence of disease .

Materials and methods

Field study: The study was carried out in different regions of AL-Diwaniyah

province including (AL-Diwaniyah center, AL-Daghara, Sumer, AL-Saniyah, AL-

Hamza, Nuffer, AL- Diwanayah Slaughter House). A total number of examined sheep were 5093 in different ages, sexes which examined clinically. 266 samples (skin scraping) were collected from the sheep suspected with mange mites infestation. The clinical signs such as severe itching, wool loss, crusts and pustules were noticed. Depending on (4) the animals were divided into two groups of age : 1st group less than two years old (1380 sheep) and 2nd group more than two years old (3713 sheep) and it also included (864 rams) and (4229 Ewes), where 266 samples collected from the sheep suspected with mange mites infestation.

Collecting of Samples

Samples were collected from the animals which showed clinical signs of the mange infestation such as hair loss, severe itch and crusty or scaly skin lesions. The wool was clipped out with scissors and then a drops of glycerine were added on the edge of lesion to moisten the area then a skin scraping was taken from edge of lesion by using Scalpel and blade no.21

The important clinical signs of the sheep infested with mite : itch where the animal attempts to rub the infested region of it's body with the legs, walls, fences, columns or biting with teeth, loss of wool. The wool becomes curly and like matted with the presence of calcified serous exudation leading to pigmentation with yellow color and easy to detach or remove and infested region seems wetness as a result of biting the animal to infested region repeatedly. Results of the laboratory tests revealed that 186 samples from a total of 266 samples collected from sheep were positive to mange mites while 80 samples were negative. The overall percentage of infestation with mange mites 3.65% from 5093 sheep examined. This study showed

deeply until the blood begins to ooze, scraping is placed in a numbered Petri dish and the information is recorded for each animal on it, then transported directly to the laboratory for proceeding diagnosis (5).

The laboratory Tests

Depending on method of (6,7) in microscopic examination for diagnosis, a part of the scraping was taken and placed in a test tube and 5 or 10 ml of KOH 10% is added to it. The tubes are placed in a water bath with 80°C for 15 minutes then transported to a centrifuge in a speed of 1500-2000 rounds per minute for 5 minutes then the supernant is discarded by an automatic pipette and the sediment is mixed well in a test tube. Then some drops are drawn from the sediment with a pipette and placed on a glass slide and covered with a cover slide. It is examined under microscope with power x10, x40, x100 to confirm the presence of parasite and diagnose the species. Depend on formalism features of mites as described by (7 , 8) in diagnosis of the samples of the study .

Results

that the sheep were infested with four genera of Mange Mites included: *Sarcoptes scabiei* was 58 cases from a total of 186 case infested with Mange Mites with percentage 31.18% figure(2), *Psoroptes ovis* was 97 cases with percentage 52.15% figure(3), *Chorioptes spp.* was 15 cases with percentage 8.06% figure(4) and *Chirodiscoides caviae* (Fur Mite) was 4 cases with percentage 2.15% figure(5). mixed infestation were found in sheep *Sarcoptes* with *Psoroptes* 11 cases with percentage 5.91% while *Psoroptes* with *Chorioptes* was 1 case with percentage 0.53% . A larvated egg of *Sarcoptes scabiei* and *Psoroptes ovis* also noticed figure (6).



Figure (1) sheep infested with mange mite.

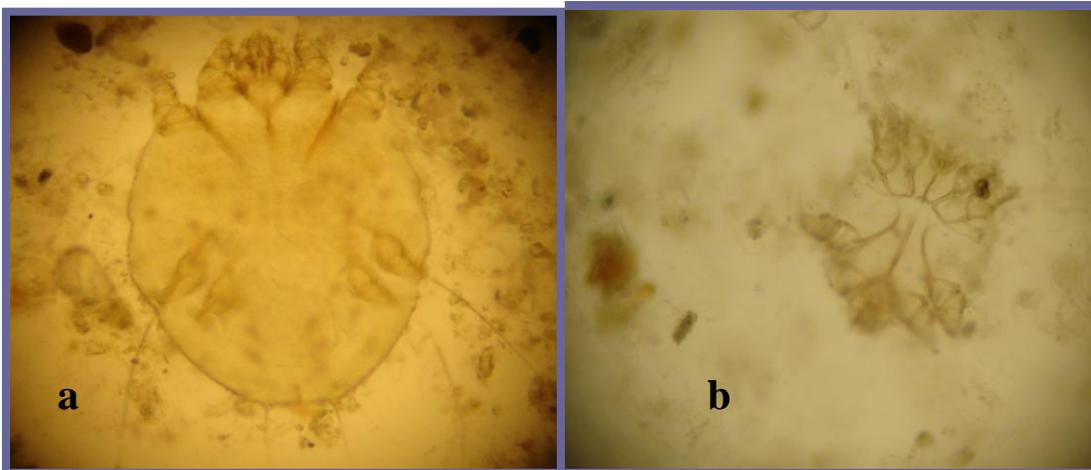


Fig. (2) ventral view of a. female of *Sarcoptes scabiei* b. male *Sarcoptes scabiei* x10.

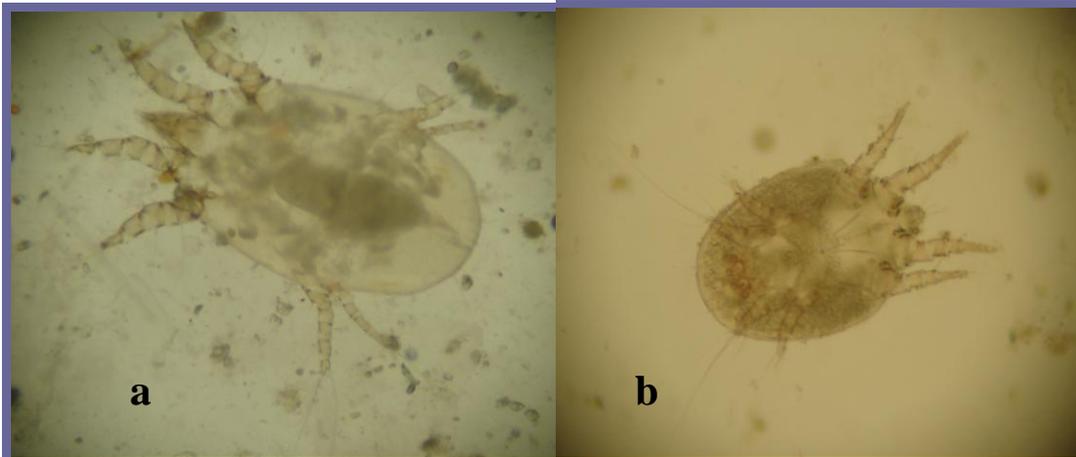


Fig. (3) a. ovigerous female of *Psoroptes ovis* . b. male *Psoroptes ovis* x10 .

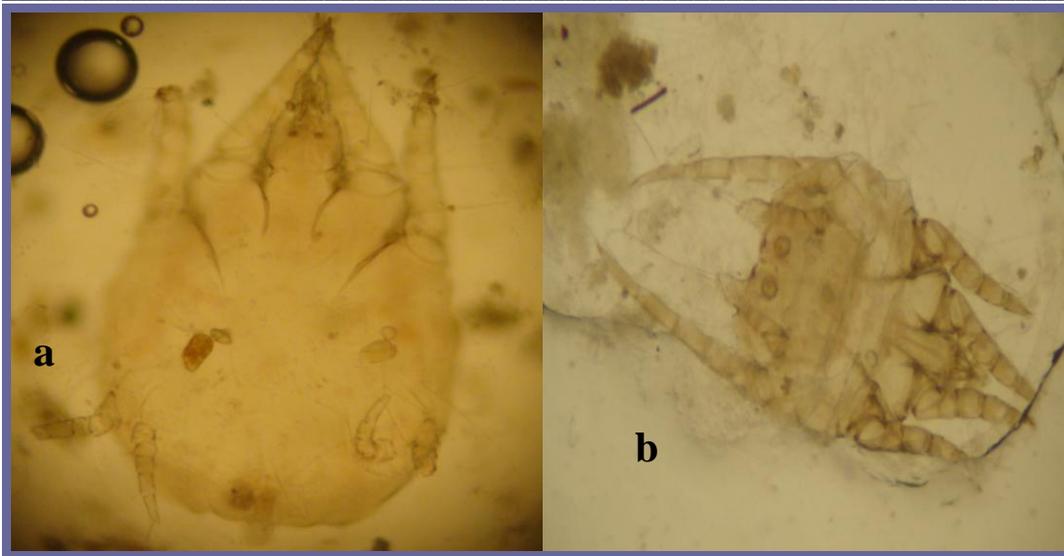


Fig. (4) Ventral view of female (a) and male (b) of *Chorioptes* spp. x10.



Fig. (5) a ventral view of *Chirodiscoides caviae* (fur mite) x10

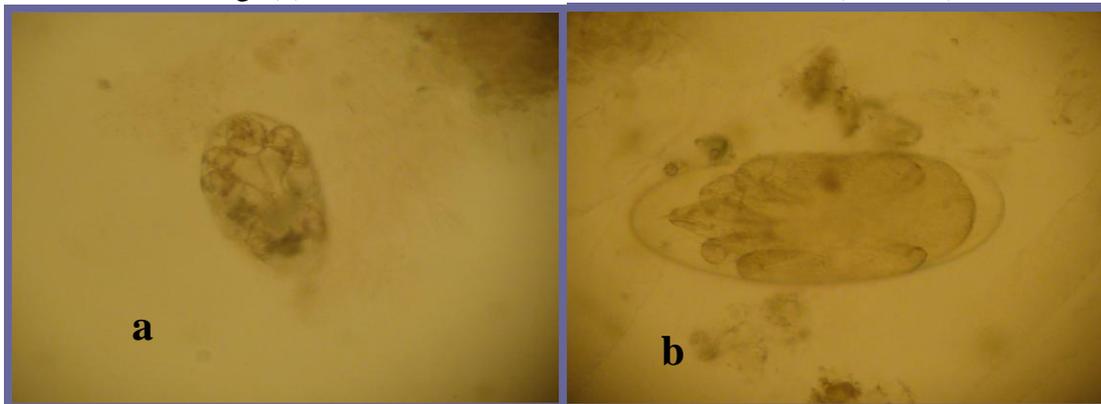


Fig. (6) a larvated egg of (a) *Sarcoptes scabiei* (b) *Psoroptes ovis* x10.

Effect of Age and Sex on Infestation with Mange Mites

Results of this study revealed that the percentages of the infestation were high in sheep more than two years old 3.74 % and low in age less than two years old 3.40%. On the other hand the high rates of mange

mite infestation in male sheep (Rams) were 3.93% compared with the females (Ewes) 3.59%, table (1). Statistically there were no significant differences ($P > 0.05$) according to the age and sex of animals.

Table (1) Relation of age and sex of animals with percentages of mite infestation in sheep :

Age of animal	Number of examined sheep	Number of infested sheep	% in comparison with examined No.
Less than 2 years	1380	47	3.40 a
More than 2 years	3713	139	3.74 a
The sex	Male	864	3.93 b
	Female	4229	3.59 b

There were no significant differences on ($p > 0.05$).

Geographic distribution of Mange Mites infestation

Results of the present study revealed that the highest infestation rates with mange mites in Al- Daghara region 9.18% followed by Al-Diwaniyah center, Sumer , Al-Hamza, Nuffer, Al-Saniyah with rates 3.53%, 2.59%, 2.06%, 2.02%, 1.85%

respectively and the lowest infestation rates were in Al-Diwaniyah slaughter house 1.6%, table (2). Statistically the differences in percentages of infestation were significant ($p < 0.05$) according to different regions of study.

Table (2) Demonstrates the infestation percentages of mange mites in the regions of the study :

Region of Study	Number of examined sheep	Number of infested sheep	% in comparison with examined No.
Al-Daghara	947	87	9.18 a
Sumer	808	21	2.59 bc
Nuffer	691	14	2.02 bc
Al-Diwaniyah center	904	32	3.53 b
Al-Saniyah	648	12	1.85 c
Al-Diwaniyah slaughter house	562	9	1.6 c
Al-Hamza	533	11	2.06 bc
Total	5093	186	3.65

* The same letters indicates that the differences were not significant ($p < 0.05$).

Discussion

The important clinical signs of the sheep infested with mite : itch and loss of wool and this agree with each of (9) clarified that causes of intense irritation and itching by toxins secreted from parasite lead to sensitization of animals and (10) referred that this parasite especially *Sarcoptes* mite burrows in the deeper parts of the stratum corneum, or the superficial layers of the stratum malpighii of the skin, and rarely goes deeper, it's completes its entire life cycle at this level, therefore; causes severe itching and loss of

hair or wool. The overall percentage of infestation with mange mites in sheep was 3.65% . Our finding nearished from the percentages readed by (1) in Iraq the whole percentage 3.74% and in Al-Diwaniyah province was 0.31% with *Sarcoptes* in sheep and (11) was 3.1% in sheep and (12) 1.2% in grazing sheep and 7.4% non-grazing with rate 4.3% with *Chorioptes* mite and (13) 2.6% with *Sarcoptes* mite in sheep in Urmia suburb, Iran .While this percentage was less than the percentages that get by each of (14) in Sudan were 50%

with *Psoroptes communis var ovis* in sheep and (15) in India was 8% in sheep and (16) 18.3% with *Psoroptes* and *sarcoptes* in sheep and (17) 34.9% and (18) 21.0 % in sheep with *Sarcoptes scabiei* in Highland Balochistan and (19) 28.1% with *Psoroptes* and *sarcoptes* in sheep and (20) was 52% in sheep with *Psoroptes* & *Sarcoptes* & *Chorioptes* and 75% with *Psoroptes* and (21) 48.8% and most with *Sarcoptes* mite in small ruminants and (22) 22.96% with *Sarcoptes* and *Psoroptes* in sheep in Baghdad province and (23) in Spain with *Sarcoptes* in sheep were 12.6% and (24) 6% with *Sarcoptes* mite and (25) 14% with *Psoroptes* mite and (26) was 15% of sheep scab in Scotland and (27) was 44.7% with *Psoroptes* in sheep. The causes for this variance may return to the variations of the environmental conditions and geographic areas (nature of earth and pastures) and mode of breeding and management of the animals and the variations of the numbers, breeds (nature of wool and its length) and the species of the animals included in the study in addition to the increment of cultural awareness of owners in using modern ways for the prevention and control of the disease by using the broad spectrum Ivermectin for regularly period in year and dipping the animals using the effective

organophosphorous compound which leads to the destruction of all external parasites, the owners consider the mange as a serious and infectious disease, therefore; they tend to treatment or selling. Results of the present study recorded that the sheep were infested with four genera of the mange mites including: *Sarcoptes scabiei*, *Psoroptes ovis*, *Chorioptes spp.* and Fur mite *Chirodiscoides caviae* where the genera of *Chorioptes spp.* and Fur mite *Chirodiscoides caviae* recorded for the first time in Iraq. Our finding differs from those (1) and (16) and (19) and (22) and (27) who recorded that Iraqi sheep infested with *Sarcoptes* and *Psoroptes* Mites only and this is owing to the variance of the numbers and breeds of the examined animals and the nature of the geographic zones of study in addition to the time lag between their studies and the present study. Results of the present study revealed that the differences in numbers and percentages of infestation between age and sex of animals was non significant ($p > 0.05$) and this indicate that age and sex of animals not effect on infestation with mites. Our finding corresponds with each of (23, 25, 28, 29, 30, 31) who confirmed that age and sex of animals don't effect on percentage of infestation with mites.

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دراسة وبائية و تشخيصية لإصابات حلم الجرب في الأغنام في محافظة الديوانية

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الخلاصة

أجريت هذه الدراسة للتحري عن نسب الاصابة بحلم الجرب في الاغنام في بعض مناطق محافظة الديوانية، ودراسة تأثير العمر والجنس على انتشار المرض.أوضحت نتائج الفحص المختبري للفشطات الجلدية التي جمعت من الأغنام ان 186 رأسا من الأغنام كانت مصابة بحلم الجرب وبنسبة اصابة كلية بلغت 3.65%.أوضحت هذه الدراسة أن أربعة أجناس من حلم الجرب تتطفل على الأغنام وهي:

Chirodiscoides caviae ، *Chorioptes* spp. ، *Psoroptes ovis* ، *Sarcoptes scabiei*

بنسب 31.18%، 52.15%، 8.06% ، 2.15% على التوالي حيث تم تسجيل حلم ال *Chorioptes* وال *Chirodiscoides caviae* لأول مرة في العراق، بالاضافة الى وجود اصابات مختلطة ب ال *Sarcoptes* مع ال *Psoroptes* بنسبة 5.91% وال *Psoroptes* مع ال *Chorioptes* بنسبة 0.53%. كانت أعلى نسبة لانتشار الحلم في النعاج بعمر أكثر من سنتين 3.74% وأوطأها في النعاج بعمر أقل من سنتين 3.40% . ان انتشار حلم الجرب في الأكباش كان أعلى وبنسبة 3.93% مقابل 3.59% في النعاج، وكانت الاختلافات غير معنوية عند مستوى احتمال ($p>0.05$) بالنسبة لعمر و جنس الحيوان. بينما كانت معنوية ($p<0.05$) حسب اختلاف مناطق الدراسة.