Diagnostic Study of the Mange Mites Infestation in Sheep in Khalis city \ Diyala 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 Khalis city and the effects of age, sex and the time of incidence of the disease were studied also. The results of the microscopical examination of the skin scraping were revealed that 133 from 2600 of the sheep were infested with mites with an overall percentage of infestation 7.942%. The prevalence of the infestation was highest in February reach 7.457% and, the lowest in December reach 2.710%.

In this study two genera of Mange Mites were recorded that parasitized sheep: *Psoroptes ovis* and *Sarcoptes scabiei*. The prevalence of the infestation was highest in sheep more than 6 months old (12.589%) and, the lowest in sheep with age between two to three years old (1.096%). The prevalence of mange mites in female sheep was 5. 311% versus 2.631% in males. Statistically there were significant differences ($P<0.05$) according to the age and sex of animals and the time of prevalence of the disease.

Introduction…

Mites infest sheep worldwide. The most important parasitic mite species of sheep are *Psoroptes ovis* that causes psoroptic mange, also called sheep scab, and *Sarcoptes scabiei* var. *ovis* that causes sarcoptic mange, also called scabies ,and *Chorioptes ovis* that causes chorioptic mange, also called leg mite, foot scab , and the last is *Psorergates ovis,* responsible for psorergatic mange, also called itch mite**.** Especially in Australia, New Zealand, South Africa, North and South America (Radostitis *etal*. ,2000)**.**

In most cases it causes no clinical symptoms and has little or no economic impact on sheep flocks. Some sheep mite species have been eradicated in certain regions, e.g. *Psoroptes ovis* in Australia, Canada New Zealand and the USA, *Psorergates ovis* and *Chorioptes ovis* in the USA. Sheep mites are not vectors of other pathogens, i.e. they do not transmit microbial diseases as many other livestock parasites do. Infestations with mites are technically called acariosis or acariasis**,** both on animals and humans.

Adult *Psoroptes* mites are ~0.75 mm long, i.e. they are usually only recognizable under the microscope. As for all mites, development goes through various larval and nymphal stages. A female mite lays 1 to 3 eggs a day, a total of about 50 to 100 eggs in her lifetime. Adult life lasts for about 50 days. The shortest life-cycle duration from eggs to eggs of the next generation is about 10 to 14 days(Rhodes,1976).

Psoroptes mites do not dig tunnels in the skin. In the past it was thought that they pierce the skin of their hosts. Today it is believed that they do not pierce the skin, but that the mite feces cause an allergic reaction of the host's skin, which reacts

producing exudations and skin thickening and hardening (lichenification) with formation of papules, scales and crusts (excoriations), mostly with wool loss. The mites feed on the exudates and secretions produced by the affected skin. Large scabs may develop that spread to cover the entire body in 2 to 3 months if left untreated. Mites concentrate at the edge of the growing scabs(Bates, 1991).

As all mite species, *Psoroptes* mites spend their whole life on the same host. Transmission within a herd is mostly by physical contact. Mites do not actively jump or crawl from one host to another one, but are passively transmitted when animals come in close contact. Nevertheless, psoroptic mites and eggs can survive 2 to 3 weeks off the host (e.g. in tags of fallen wool, on fence posts, etc.) by suitable conditions (maximum of 12 weeks by cold weather). This means that sheep can pick mites or eggs from their environment, especially from those objects that affected sheep use for rubbing, e.g. fence posts. But there are no external vectors that transmit the mites, e.g. insects, worms, rats, mites, birds, etc., as it happens with many other parasites.

Sheep scab is a serious and very harmful sheep disease. Lesions often affect the back, the flanks and the shoulders. Infestations remain often unnoticed until wool loss becomes evident, which mostly means that the whole flock is probably already infested. Affected animals suffer from intense itching (pruritus) and react vigorously scratching, biting and rubbing against objects, which causes injuries that can be infected with secondary bacteria. All this leads to weight loss and wool loss, reduced milk production, and general weakness that makes the affected animals more susceptible to other diseases. Left untreated it is often fatal, especially for lambs. Hides of affected animals are downgraded

or rejected at slaughter. The short life cycle allows quite sudden outbreaks that can be devastating if left untreated.

Diagnosis is based on the presence of the previously mentioned symptoms, but has to be confirmed examining skin scrappings of affected parts under the microscope for visualization of the mites. Psoroptic mites are not infectious for humans, dogs and cats.

Sarcoptic mites of sheep are a species-specific strain of *Sarcoptes scabiei*, a mite species that infests also cattle, pigs, other livestock and also humans. This means that it can be transmitted to humans. They are less abundant on sheep than psoroptic mites.

Sarcoptic mites are very small (0.3 to 0.5 mm) and can be seen only under the microscope. As all mite species, sarcoptic mange mites spend their whole life on the same host. Mites do not actively jump or crawl from one host to another one, but are passively transmitted when animals come in close physical contact. However, sheep can pick mites from the immediate environment or fomites. There are no external vectors that transmit the mites, e.g. insects, worms, birds, etc., as it happens with many other parasites.

The mites dig tunnels beneath the skin. Their saliva has potent digestive enzymes that dissolve the skin tissues. They feed on the resulting liquids. They do not suck blood. Adult females deposit their eggs in tunnels, which hatch in 3 to 5 days. The whole development through several larval and nymphal stages can be completed in less than 2 weeks. Adults live for 2 to 3 weeks. Off the host the mites survive only a few days.

Sarcoptic mange is also a winter pest in regions with a cold season, for the same reasons and with similar dynamics as previously mentioned for sheep scab (Schmidt and Roberts , 2005).

As soon as the animals go back to pasture in spring exposure to sun reduces the humidity in the hair coat, which slows down mite development, and without crowding mire transmission is significantly reduced.

If a herd is free of mites, contamination can only come from cattle brought in. Consequently, to avoid contamination all incoming animals must be treated against mites, also those that went to the a fair or to the market and came back unsold: they may have picked mites from other sheep**.** Two injections with a macrocyclic_lactone (e.g. doramectin, ivermectin, moxidectin) with 7 to 10 days interval should do the job, but keep the animals isolated until 10 days after the second injection. Remember that sheep may be infected with mites without showing clinical signs! Topical sprays and pour-ons are not reliable for controlling psoroptic mites.

For the time being there are no vaccines that will protect sheep by making them immune to the mites. There are no repellents, natural or synthetic that will keep mites away from sheep. There are no biological control means for controlling sheep mites (or any other mites of livestock and pets).

Injectable macrocyclic lactones are highly effective against psoroptic mites. A single doramectin injection (300 mcg/kg bw), or 2 ivermectin or moxidectin injections (at 200 mcg/kg bw 7 days interval) are enough to ensure complete control. The major disadvantage is that they are substantially more expensive that topical products.

There are reports on field resistance of *Psoroptes ovis* (sheep scab) against some organochlorines and organophosphates in Argentina, and against a few organophosphates and synthetic pyrethroids in the UK. However it does not seem to be a widespread problem and such products are still effective in many properties in these countries.

Materials and Methods

1.The Samples Collection

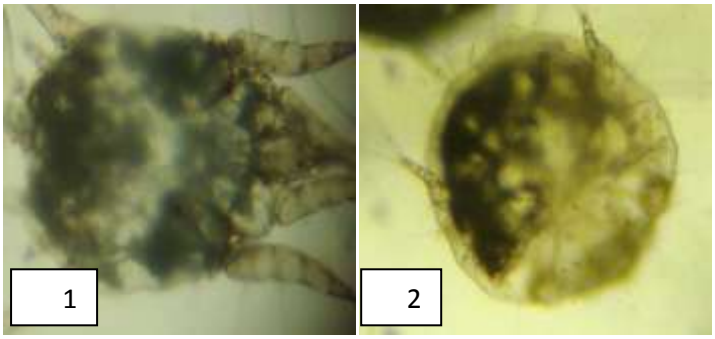
Fifty samples were collected from the sheep which showed clinical signs of skin disease for isolation and identification of the causative agent. Evaluation of the general state of the animals, temperature, pulse rate, respiratory rate, appetite and morbidity rates were recorded. The shape, size, position, distribution and time of the appearance of skin lesions as well as the age of the animals were also recorded .The skin scales were collected by scraping of the lesion deeply using a sterile scalpel. These scraping samples were taken from the peripheral or edge of the lesion, then collected into sterile Petri dish and transmitted to the laboratory under aseptic conditions .

2.Direct microscopic examination:

The specimens is treated with 10% KOH to dissolve tissue material.

The results…

Two genera of Mange Mites were recorded that parasitized sheep: *Psoroptes ovis* and *Sarcoptes scabiei* which invade superficial keratinized structures such as skin , hair and claws. Each species in sporadic case or in mixed infection. The figures (1)and (2) reveals the mature mite of the two species which isolated from infected sheep respectively .



Figure(1): reveals the *Psoroptes* mite

Figure(2): reveals the *Sarcoptes* mite

The table (1) reveals the rate of the mange infection according to the sex of the sheep in Khalis city.

The examined animals due to the sex	The total number	+ve	%
male	190	5	2.631
female	2410	128	5.311
The sum	2600	133	7.942

The table(2) reveals the rate of the infection according to the age scale of the sheep.

The age of the sheep in months	The male			The female		
	Total number	+ ve	%	Total number	+ ve	%
6-12	84	3	3.571	278	35	12.589
13-24	49	1	2.040	135	13	9.629
25-36	15	-	-	741	08	1.096
37-48	28	-	-	827	23	2.781
49-60	13	1	7.692	310	37	11.935
61- 72 and over	1	-	-	119	12	10.084
The sum	190	5	13.54	2410	128	5.311

The table(3) was revealed the rate of the infection according to the time of examination.

The time of examination	The total number of examined animals	+ve	%
November 2013	241	12	4.979
December 2013	369	10	2.710
January 2014	1048	56	5.343
February 2014	295	22	7.457
March 2014	190	12	6.315
April 2014	457	21	4.595

Discussion…

The results in table(1) was revealed the rate of the mange infection in male and female sheep reached to 2.631% and 5.311% respectively. This study agree with AL-Kardi, (2013) who found the rate of Mange Mites Infestation reach to 7.17% in Al-Najaf Al-Ashraf province. Also this study didn't agree with Al-Shebani *etal*. ,(2012) study who found the rate of Mange Mites Infestation reach to 3.65% in Al-Diwaniyah province. Also this study didn't agree with Husain *etal*.,(2010) and Husain and Ali ,(2014) study who are found the rate of mange mites Infestation reach to 3.65% in Baghdad and Diyala province respectively.

The results in table(2) was revealed the rate of mange infection according to the age of the infected animals so the highest rate reach to 12.589% in age stage 6 to 12 months while, the lowest was 1.096% in age stage 25 to 36 months. This study didn't agree with Al-Shebani *etal*. ,(2012) study who found the highest rate in sheep more than two years old (3.74%) and the lowest in sheep with age less than two years old (3.40%). Also this study didn't agree with Husain and Yunis,(2010) study who found the highest rate was 22.96% in age stage 2 to 4 years, while the lowest was 15.91% in age stage 1 to 2 years. Other study was done by AL-Kardi (2013) refers to the prevalence of the infestation was highest in sheep older than two years (9.02%) and the lowest in sheep with age younger than two years (1.9%).

The results in table(3) was revealed the rate of the mange infection according to the time of the infection so, the highest infection was 7.457% in February, while the lowest rate was 2.710 in December . This study agree with Husain and Ali,(2014) study who found the highest rate in February, while the lowest in June.

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الدراسة التشخيصية لإصابات حلم الجرب في الأغنام في مدينة الخالص

الخلاصة

أجريت هذه الدراسة للتحري عن نسب الاصابة بحلم الجرب في الاغنام في بعض مناطق قضاء الخالص ، ودراسة تأثير العمر والجنس على انتشار المرض.أوضحت نتائج الفحص المختبري للقشطات الجلدية التي جمعت من الأغنام ان133رأساً من مجموع 2600 نعجة كانت مصابة بحلم الجرب وبنسبة أصابة بلغت 7.942% . كانت أعلى نسبة أصابة في شهر شباط وصلت الى 7,457% وأقل نسبة كانت في شهر تشرين الأول وصلت 2.710%.

أوضحت هذه الدراسة أن جنسين من حلم الجرب سجلت هي

Psoroptes ovis and *Sarcoptes scabiei*

كانت أعلى نسبة أصابة في الفئة العمرية أكثر من ستة أشهر اذ بلغت 12.589% وأقلها في الفئة العمرية من سنتين الى ثلاث سنوات وكانت 1.096%. بلغت نسبة الذكورالى 2.631%. أوضح الأصابة في الأناث 5.311% ، بينما وصلت في التحليل الأحصائي بوجود فرق معنوي أحصائي عند مستوى الأحتمالية في تأثير ($P<0.05$)عامل العمر و الجنس ووقت انتشار المرض.