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## Ectoparasites of farm animals in Diyala province, Iraq

R. H. Hasson

College of Veterinary Medicine/ University of Diyala

### Abstract

72 ectoparasitic infested clinical cases were collected from different productive animal species presented to Diyala, Vet. College teaching hospital from owners in and out of Baquba city in Diyala province for 6 months period during years 2015-2016. Results showed that Sheep had the highest infestation with ectoparasites n=50 (69.4%) particularly with face mange n=44 (61.1%) then sheep with myiasis n=6 (8.3%), then cattle infested with ticks n=12 (16.7%) , followed by pigeons with lower infestation n=8 (11.1%) with lice; Research revealed that lowest number of infestation with myiasis were reported in horse and dog n=1 (1.4%) for each. January month show the highest number parasitic infestation n =40 (55.6%) for sheep face mange followed by October n=16 (22.2%) in favor of tick cattle infestation n=6 while September month with lower infestation n=11(15.3%) in favor of tick cattle infestation n=4. Ectoparasites of animals diagnosed in study were larvae of flies *Chrysomya bezziana*; Mites, *Sarcoptes scabiei var. ovis* and *Sarcoptes scabiei var. equi*; Ticks, *Hyalomma analoticum analoticum*, *H.a. excavatum*, *Rhipicephalus turanicus*, *R.bursa*, and lice *Columbicola columbae*. Highest infestation prevalence was recorded in winter particularly in January may be due to cold which reduce animal resistance to parasitic infections.

**Key words:** Animals, Ectoparasites, Myiasis, Mites, Ticks and Lice.

**E-mail:** rhrh52 @ yahoo.com

### الطفيليات الخارجية للحيوانات الحقلية في محافظة ديالى، العراق

رعد حمودي حسون

كلية الطب البيطري/ جامعة ديالى

### الخلاصة

جمعت اثنتان وسبعون عينة مصابة بالطفيليات الخارجية من مختلف الحيوانات الحقلية وردت الى المستشفى التعليمي لكلية الطب البيطري جامعة ديالى من المربين داخل وخارج مدينة بعقوبة ولفترة 6 اشهر من العام 2015-2016. بينت النتائج ان الاغنام المصابة بالجرب وعددها 50 (69.4%) اكثرها مصابة بجرب الوجه بعدد 44 حيث جاءت بأعلى نسبة (61.1%) واقليتها مصابة بالنغف بعدد 8 (8.3%)، تلتها الابقار المصابة بمختلف انواع القراد بعدد 12 (16.7%) ثم حل بعد الحمام بعدد 8 (11.1%) مصابا بالقمل واخيرا سجلنا اصابة حصان بالجرب وكلب بالنغف بنسبة (1.45%) لكل منهما. اظهرت الدراسة ان شهر كانون الثاني سجل اعلى نسبة اصابة بالجرب (55.6%) في الاغنام بعدد 40 ثم جاء شهر تشرين الاول بنسبة اصابة (22.2%) بعدد كلي 16 وخاصة للقراد في الابقار بعدد 6 واخيرا ظهر شهر ايلول باقل نسبة اصابة (15.3%) بعدد كلي 11 للقراد في خاصة الابقار بعدد 4. شخّصت في الدراسة طفيليات خارجية من انواع اللحم *Sarcoptes scabiei* و *Sarcoptes scabiei var. ovis* و *Chrysomya bezziana* و *Hyalomma analoticum analoticum*, *H.a. excavatum* و *Rhipicephalus turanicus*, *R.bursa excavatum*, *Columbicola columbae* والقمل. سجلت اعلى اصابات بالطفيليات الخارجية في الشتاء بشهر كانون الثاني البارد حيث يبدو بان الجو البارد يقلل من مقاومة الحيوان للإصابة بطفيليات.

الكلمات المفتاحية: الحيوانات، الطفيليات الخارجية، النغف، العث، القراد والقمل.

## Introduction

The ectoparasites are of veterinary importance because they cause a pathogenic effect on the host which in turn causes economic loss to the farmer, either through stock loss or the need to finance preventative measures such as dipping or showering, in addition to the labor involved in fund and the capital outlay for equipment. Other parasitic diseases also add to a farmer's annual bill for insecticides e.g. birds pigeons. These treatments can be complicated by parasiticide resistance, which can occur after years of use and which means that veterinarians and farmers have to find alternative-sometimes more expensive- solutions for control (1). The ectoparasites disease symptoms includes blood loss/anaemia, dermatitis and open sores in skin and can vary in duration and in severity, from being unnoticed to morbidity and in severe cases to mortality. Various groups of ectoparasites such like Diptera flies, ticks, mites and lice cause significant infestations in many kinds of domestic animals including livestock, pets, laboratory animals, poultry, fish and bees. Dipteran flies group caused myiasis to hot blood animals and human, made tissue damaged or death in animals in heavy infestation (2). 'Myiasis' caused by certain families larvae e.g. Calliphoridae (blow flies) and Sarcophagidae (flesh flies). Different body regions are attacked by different fly larvae, and gastro-intestinal, urogenital, ocular, nasopharyngeal, auricular or cutaneous myiasis. The old world screw worm fly *chrysomya bezziana* is an obligatory parasite; The first recorded of *chrysomya bezziana* in Iraq in animals at 1996 (3). Ticks Group are obligate haematophagous ectoparasites of amphibians, reptiles, birds, And/or mammals during some or all phases of their life cycle. For recent overviews of the Ixodida According to some estimates, 80% of the 1.23 billion cattle in the world are infested with ticks (4), and ticks are responsible for severe losses due to tick worry, blood loss, damage to hides and udders, injection of toxins, or mortality and debility caused by transmitted disease organisms. The genus *Boophilus* comprises five species, all of which are important pests of cattle, sheep and goats. Both *B. microplus* and *B. annulatus* are efficient vectors of *Babesia* spp. and *Anaplasma marginale*; The genus *Hyalomma* is distributed over an area stretching from the Mediterranean basin eastwards to the Indian subcontinent and southwards throughout Africa. These ticks are typically found at low altitudes in zones with long, hot dry seasons. In addition to transmission of disease agents such as bovine and equine babesiosis, and Crimean-Congo haemorrhagic fever, the long mouthparts of *Hyalomma* spp. cause intense wounds and lameness. Some species cause paralysis, and some populations of *H. truncatum* cause sweating sickness; *Rhipicephalus bursa* is found throughout the entire Mediterranean, Adriatic and Aegean basins, including on the islands. It is also found in Switzerland, Bulgaria, Romania, Iraq, northern Iran, Azerbaijan, Georgia, Kazakhstan, Turkmenistan and Ukraine. Hosts include sheep, goats, cattle and other domesticated animals. Numerous disease organisms have been reported from *R. bursa*. *Babesia ovis* is probably the most commonly-reported disease agent in this species of tick, but *B. bovis*, *B. bigemina*, *B. equi*, *Anaplasma marginale* and *Coxiella burnetii* have also been recorded. Thogoto virus has been isolated from *R. bursa* in Sicily, and Crimean-Congo haemorrhagic fever virus in Greece and Kyrgyzstan. *R. bursa* is also known to cause paralysis in sheep (5). The parasitic mites as a group, represent an extremely diverse range of ectoparasites; The sarcoptid mange mites (family Sarcoptidae), also known as itch mites, are immensely important ectoparasites of domestic mammals. The burrowing action of these mites causes intense irritation to hosts, which may consequently rub off much of their fur or skin. Secondary immune reactions or secondary

infestation can also result. The mange mite (*Sarcoptes scabiei*) is an important cosmopolitan parasite of many domestic mammals, causing sarcoptic). Some authors have regarded *S. scabiei* populations from different host species as different mite species, subspecies or strains, but current data provide little evidence to support this view. Horses, mules, donkeys, cattle and primates are also frequently infested with *S. scabiei* mange (6). Several genera of chewing lice occur on domestic birds, and large infestations can cause irritability, poor weight gains or anemia from these species. *Columbicola columbae* feeds by chewing on the feathers of their pigeon hosts, particularly feeding on the downy part of the wing feathers (7). This study is originally designed and conducted to investigate local ectoparasites infestations of productive domestic animals in Diyala province; purposed data will assist in identifying the host infectivity prevalence and identification of the species of Ectoparasites involved. Present Study Contribute as a long term database on the occurrence of these pests among domestic fauna in the country.

### Materials and Methods

This study was carried out on 50 sheep *Ovis aries*, 1 dog *Canis familiaris*, 1 horse *Equus caballus*, 12 cattle *Bos Taurus* and 8 pigeon *Columbia livia domestica* ectoparasitic infested clinical cases presented to Vet. College teaching hospital and from owners in and out of Baquba city in Diyala province for 6 months period during years 2015-2016.

- **Collection of Samples:** The collection was made by two visits weekly to clinics and the available 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 brought to clinics was inspected for presence of ectoparasites like (tick, louse, fleas, ked, burrowed larva of insects). All visible adults, larvae, nymph of ticks and lice 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 collected by catching individually 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 (8); 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. All samples properly labeled and brought to Faculty of Veterinary Medicine lab. of parasitology for examination and identification.
- **Laboratory Examination:**
- **Tick identification:** Few of Recovered adult arthropods & larvae were cleared in boiled 10% NaOH<sub>(aq)</sub>; or lactophenol for different times periods at room temperature; mounted in between slide and cover slip by Canada balsam, which placed in 40c° oven for few days to harden mounting medium; then morphologically identified after using valid references such as (9, 10, 11). For mite collection, deep skin scraping examined by method of skin concentration method, which described by (12). The samples mixed with 10 volumes of 10% KOH solution and 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 (13). All parts of the pigeon were thoroughly inspected using naked eyes. Ectoparasites were collected by hand picking and non toothed thumb fine forceps (14). The collected parasites were further examined by light or stereomicroscope and identified according to guidelines of William [William, 2001]. Lice collected were placed in specimen bottles containing 70% alcohol as preservative. Many larvae were collected from injury of infested cattle by medical forceps. Methyl alcohol 96% was put inside the infested tissue to make the larvae exhausted and suffocated and leave wound outside injury; after that larvae were collected and kept in clean container with 70% alcohol. The collected sample was sent to laboratory for identification (15, 16).

- Statistical analysis: using SPSS software (IBM SPSS statistics 20).

### Results

From 72 animals ectoparasitic infested clinical cases attended to Vet. College teaching hospital and from owners in and out of Baquba city in Diyala province for 6 months period were comprised (50 sheep (69.4%), 1 dog (1.4%), 1 horse (1.4%), 12 cattle (11.1%) infested with various types of ectoparasitic infestations. Table (1) and Fig (1). Results shows sheep n=50 were infested with face mange n=44 (61.1%) and myiasis n=6 (8.3%); cattle n=12 (16.7%) infested with different species of hard ticks; pigeon n=8 (8.3%) infested with lice; while the least infestation were in dog n=1 (1.45%) infested with myiasis and horse n=1 (1.45%) infested with mange. The major ectoparasites species identified were mites on sheep n=44 and horse n=1 of *Sarcoptes scabiei var. ovis* and *Sarcoptes scabiei var. equi* respectively; hard ticks species identified on cattle were *Hyalomma anatolicum anatolicum*, *H.a. excavatum*, *Hyalomma asiaticum asiaticum*; *Rhipicephalus turanicus*, *R.bursa*; lice species on pigeon identified as *Columbicola columbae* and lastly the myiasis larvae identified were of *Chrysomya bezziana* fly from sheep and dog. Table (2) and Fig. (2, 3, 4, 5, 6, 7, 8, 9). Time distribution of ectoparasitic infested clinical cases were noticed on January month which shows the highest number infection n =40 (55.6%) for sheep face mange followed by October n=16 (22.2%) in favor of tick cattle infection n=6 while September month with lower infection n=11(15.3%) in favor of tick cattle infection n=4. Table (3) and Fig. (9).

**Table (1) Shows № of examined, infested animals**

Animal	number	Percent%
Sheep	50	69.4
Dog	1	1.4
Horse	1	1.4
Cattle	12	16.7
Pigeon	8	11.1
Total	72	100.0

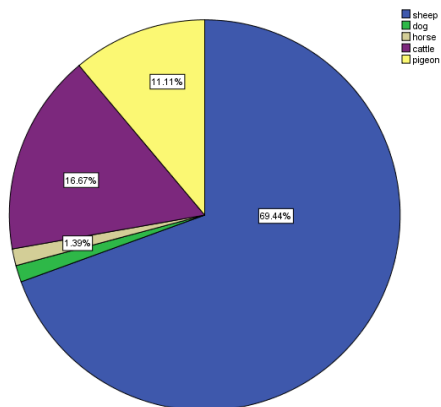


Fig. (1) Shows types and № of examined infested animals

Table (2) Shows types and № of examined ectoparasites species

Parasite	No. of cases	Percent %
<i>Chrysomya bezziana</i>	7	9.7
<i>sarcoptes scabiei var ovis</i>	44	61.1
<i>sarcoptes scabiei var equi</i>	1	1.4
<i>Hyalomma_spp</i>	12	16.7
<i>Columbicola columbae</i>	8	11.1
Total	72	100.0

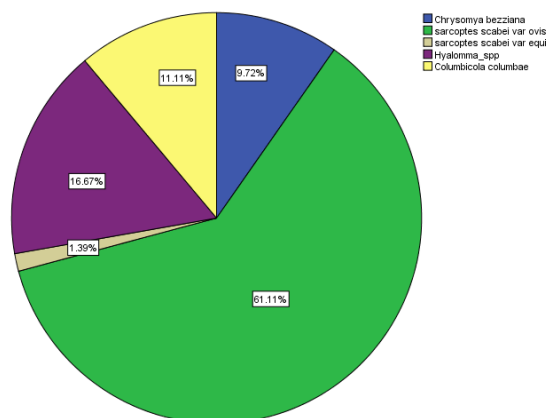
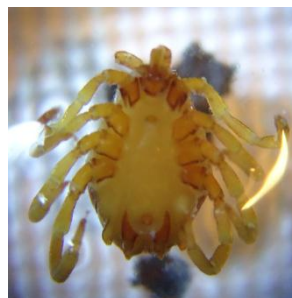


Fig. (2) Shows types and № of examined ectoparasites species



Fig. (3) Shows *Sarcoptes scabiei var. ovis*



**Fig. (4) Shows *Hyalomma analoticum analoticum***



**Fig.(5) Shows *H.a. excavatum***



**Fig. (6) Shows *Rhipicephalus turanicus***



**Fig. (7) Shows *Rhipicephalus bursa***



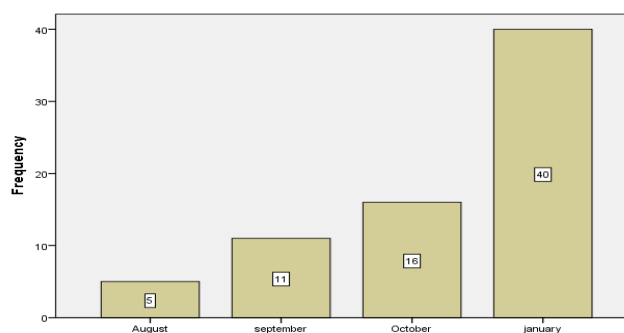
**Fig. (8) Shows *Columbicola columbae***



**Fig. (9) Shows larvae of *Chrysomya bezziana***

**Table (3) Shows monthly № of examined infested animals**

month	No. of cases	Percent %
August	5	6.9
September	11	15.3
October	16	22.2
January	40	55.6
Total	72	100.0



**Fig. (10) Shows monthly № of examined infested animals**

### Discussion

Almost all significant ectoparasites of domestic animals are arthropods invertebrates (insects, arachnids and crustaceans). Some of these ectoparasites are of particular importance as vectors of pathogens. Many ectoparasite species are host-specific, and vector species typically transmit characteristic pathogens (5); and according to (17) sequence of Clinical diseases of farm animals distribution appeared as Septicemia, parasitic cases/diseases, and pneumonia were the most frequent cases observed. Mites sheep infestation results were found generally agreed with (12) and with (13); our results about



identification of sheep face mange mite species *Sarcoptes scabiei* var. *ovis* and its high prevalence cold month January, they were agreed particularly with (18) in diyala, In regard to the months of the study there were a clear significant difference between the regions  $p < 0.05$  with the highest rate has been recorded in February which was 45.9% while the lowest rate in June 4.41%. Almost the dry mange mite infected wool less areas, the head region show the highest rate 84.72% compared to other body less wool regions and it was absent in belly and fat tail regions.; Our data about sheep mites were disagreed with (19) work on sheep and goats in Duhok province, north Iraq who found, 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; and also differ with results of (20) in Basrah, Three species of mites were diagnosed on sheep, *Sarcoptes scabiei*, *Psoroptes ovis* and *Chorioptes sarcoptes*, with percents of infection 34.95%, 58.27%, 4.71% respectively. Results of cattle's tick identification and seasonal distribution in Diyala province Agreed with (21) work's on ticks of sheep and cattle in Baghdad's south suburb area; and (22) work's on Cattle and buffaloes tick's infestation in Wasit province districts; Generally Our result agreed with (23) Work's on ticks of middle and south of Iraq but with exception of *Hyalomma asiaticum asiaticum* that they were not founded to infest cattle in their work; our study results of *R. turanicus* were found to infest cattle disagreed with (24) who conclude that only *R. turanicus* and *R. sanguineus* were found infest the dogs and cats for the first time in Iraq; but our result of *Hyalomma asiaticum asiaticum* infest cattle agreed with same author in Basrah (24). Ectoparasite Infestation in pigeon in this study was identified as *Columbicola columbae* which disagreed with results of (25). Who revealed that the pigeons were infested with two Lice species, *Columbicola columbae* and *Campanulotes bidentatus caompare* in a rate 44.66%, 1.66% respectively; our results agreed with work of (26) in Gharbia governorate, Egypt were they found, The examined birds were parasitized, exclusively, by the mallophages, *C. columbae*. Myiasis results in our study; Myiasis of cattle causative agent identified as larvae of screwworm fly *Chrysomya bezziana* which agreed with results of (16) who recorded infestation myiasis comprised of 97.01% larvae of screwworm fly *Chrysomya bezziana* and infestation rate in cattle, had the highest rate 46.3% of myiasis amongst other animal in Baghdad area. Our results shown that *Chrysomya bezziana* still represent high risky infectious problem to livestock and human in Iraq because of it's causing multi micro foci of infections in mid and south provinces in Iraq, which agreed with conclusion of (27, 28), that, The high numbers of myiasis in most provinces in the late 1990s were followed by lower numbers and subsequent apparent elimination in about half of the provinces; in spite of the claim's of (15) who concluded that, no cases were recorded in all town of Iraq especially in Basra which have big problem of infestation of old world screw worm in animals at 2004-2005. Generally agreement and disagreement results of different research's could be attributed to, as stated by (29), Prevalence and intensity of pathogenic infestations are often seasonal and occur in many species and may be linked to changes in the host or to seasonal changes in the prevalence of the pathogen or vector. Recommendations, Little or no research has been conducted into the effects of some of the less important parasites such as mange on camels, ostriches or lice on horses and dogs, and much still remains to be learned even about the more common parasites of farm animals.

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