



Survey of Lice (Order: Phthiraptera) Parasitizing Sheep in Basrah Province-Iraq

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Abstract

The study was conducted in Basrah province/ South of Iraq, from November 2024 to October 2025. The survey of lice was done in five stations: Al-Zubayer, Al-Qurnah, Shatt Al-Arab, Abu Al-Khaseeb, and Basrah City. The collection included slaughterhouses, sheepfolds, farms and livestock markets. Samples were collected from various sites of the sheep body, including: head, neck, abdomen, trunk, and extremities. The total number of sheep examined was 331. The results of the survey showed the prevalence in the examined sheep was (48.34%). Lice species identification was accomplished based on modern taxonomic keys. The identification included observing some morphological characteristics. Sheep were infested with six species of lice: four were sucking lice *Linognathous capillatus* (Enderlein,1904), *Linognathus vituli* Linnaeus,1758, *Linognathus africanus* (Kellogg and Paine,1911), *Linognathus ovillus* (Neumann,1907), and two species of chewing lice *Bovicola ovis* Linnaeus,1758, and *Bovicola caprae* (Gurlt,1843). *Solenopotes capillatus* was recorded in Iraq for the first time. Sheep was recorded as a new host for the *Linognathus vituli*, which had previously been recorded on cows.

Key words: Sheep, Chewing lice, Sucking lice.

Introduction

Sheep play a crucial role in the evolution of the global livestock sector, as they are raised in a wide range of environments extending from cold mountainous regions to deserts (1). Sheep farming is an important economic activity, providing an essential source of animal protein and enhancing agricultural income and food security for rural communities (2). Global statistics indicate that sheep meat production reaches about nine million tons annually, making it ranked fourth globally after pork, poultry and cow meat in terms of consumption (3). Despite this economic importance, sheep animal production is negatively affected by ectoparasites, the most prominent of which is lice (4). These parasites cause a decrease in growth and production rates in sheep (5).

Lice are obligate ectoparasites that depend on the host for their nutrition, as they feed on blood and skin secretions (6). There is a high degree of host specificity, as they are usually associated with a one specific host, and some species even show a preference for specific areas of the body of one host (7). Lice cause persistent skin irritation and itching, which leads to weight loss and reduced animal production rates (8). Numbers of lice often reach their highest levels during the cold winter months, while they decline in the summer season as a result of rising temperatures (9). Its entire life cycle is completed on the host's own body without leaving it at any stage (10). External parasites, including lice, pose a biological and economic risk to animal production herds, and their danger increases in areas where veterinary services are weak (11). This work aimed to determine the diversity and prevalence of lice in sheep in Basrah province/ South of Iraq.

Material and Methods

Study Area: The study was done in Basrah province/ South of Iraq, from November 2024 to October 2025. Al-Zubair (west), the collection included slaughterhouses as well as sheep spread in the desert. Al-Qurna (north), the collection included sheepfolds. Shatt Al-Arab (east), the samples were collected from sheep grazing in the farms and slaughterhouses. Abu Al-Khaseeb (south), the collection was made from random slaughtering and the livestock market. In Basrah City (central), the collection was from random slaughterhouses.

Collection and Preparation of Lice

The total number of sheep examined was 414. Samples were collected from various sites of the body likely to have lice, including head, neck, abdomen, trunk, and extremities. Lice parasitizing sheep were captured by direct examination of the wool using a special comb while combing all areas of the body. Combing was done in the opposite direction of the fibers to release parasites more efficiently. A magnifying lens and a fine brush periodically moistened with glycerin were used to facilitate the collection. A part of the wool was cut in some cases. Preparation of lice specimens was according (12).

Immediately after collection, the samples were placed in small bottles containing 70% ethanol for long-term preservation, then transferred to the Laboratory. The examination by light microscope, and samples were photographed with a high-resolution laboratory imaging system (Sadiq Mithal Office for Scientific Imaging/Baghdad), was used to show fine details, by use of a Sony camera with canon mpe65mm lens, and helicon focus 8.1.0.

Taxonomic Study

Lice species identification was accomplished based on modern taxonomic keys (13-18). Lice samples were accurately characterized by the most important taxonomic morphological characteristics of the families, genera and species of lice. The identification included observing differences in the shape of the head, number of antennae, optic lobes, sternal plates, the arrangement of hairs on the abdomen, and the genital structures. The diagnosis was confirmed by the Iraq Natural History Research Center and Museum, University of Baghdad, under the museum No. PM51.25.

Results

The results of the study showed that sheep were infected with six species of lice, four of which were sucking lice and two species of chewing lice. The prevalence in the examined sheep was (48.34%). The species were identified, namely, *Solenopotes capillatus* (Enderlein,1904), *Linognathus vituli* Linnaeus,1758, *Linognaths africanus* (Kellogg and Paine,1911), *Linognatgus ovillus* (Neumann,1907), *Bovicola ovis* Linnaeus,1758, and *Bovicola caprae* (Gurlt,1843). Figure 1 shows the prevalence of species-infested sheep during the study period.

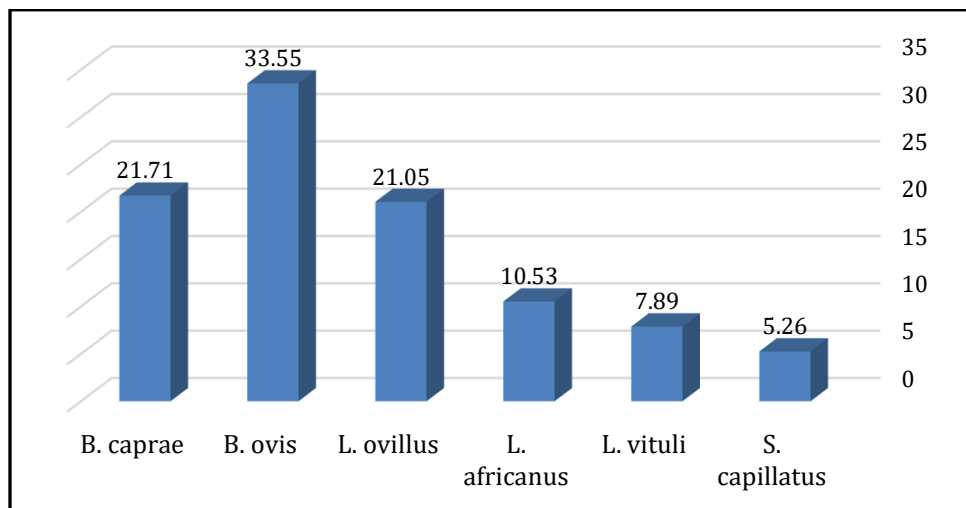


Figure 1: Prevalence of species infested sheep during study period.

1- *Solenopotes capillatus*

Materials: 9 ♀, Zubair.

Diagnostic characters

Body length 1.4–1.6 mm. The body is short, oval and dorsally-ventrally flat. The color is brown with copper spots or pale blueish, and the color gets darker when the abdomen is filled with blood. The head is short, its posterior base attached transversely to the thorax without a clear neck, while the anterior edge is slightly rounded. No simple eyes, the lateral side is almost devoid of ocular structures. Antennae are short, consisting of five pieces; the fourth and fifth are wider than the other pieces. The ventral surface of the thorax stands out as a broad, almost hexagonal plate, which is an important diagnostic character of this species.

The middle and hind legs are roughly the same length, the front legs are slightly smaller, with a small claw. The abdomen is oval in shape, and its dorsal surface is covered by a bluish or gray color gradient with darker spots. Small tubercles are attached to the plates that surround the spiracles. Female genital structures are large oval plates with clear edges, with several short hairs (Figure 2).



Figure 2: *Solenopotes capillatus* female

2- *Linognathus vituli*

Materials: 19♀, 5♂. Zubair, Shatt al-Arab, Abu al-Khaseeb.

Diagnostic characters

Body length 1.8-2 mm, yellowish in color with grey spots in the thoracic and abdomen. Head elongated, narrow base. It lacks eyes and visual lobes. Legs graduated in length, and the claws were strongly curved. The dorsal surface of the abdomen is covered by thin, membranous plates, and the lateral plates are completely missing. Darkly pigmented spots appear on the abdomen, and long hairs on the sides from the fifth to the eighth segment. The female genital area is oval in shape and partially separated in its middle (Figure 3).

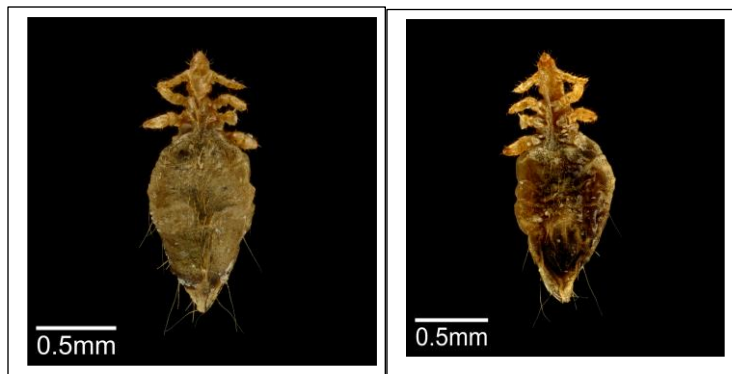


Figure 3: *Linognathus vituli* female

3- *Linognathus ovillus*

Materials: 103 ♀. Zubair, Qurnah.

Diagnostic characters: Body length 1.95-2.24 mm. Head elongated. The forehead extends clearly forward, and on its front surface, a number of short, regular hairs are observed on the leading edge. Legs are slightly shorter than the middle and back legs. The middle segment of the abdomen wider. Along the abdomen, there are groups of short hairs. It is surrounded by six pairs of circular plates with thick edges. The female reproductive structure is in the form of a pair of enlarged apical lobes. There are also smooth lobes tilted slightly downward, covering the genital pore. At the end of the abdomen, there are many long hairs (Figure 4).

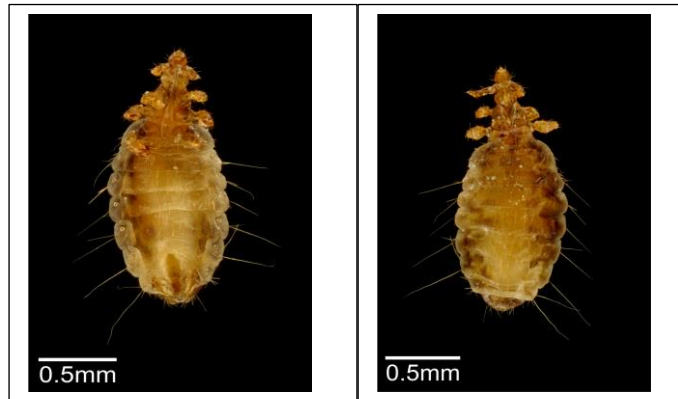


Figure 4: *Linognathus ovillus* female

4- *Linognathus africanus*

Materials: 73♀, 15♂. Zubair, Abu Al-Khaseeb.

Diagnostic characters

Body length 2-2.35mm. elongated body, light yellowish color, with dark spots on the abdomen. Head slender and spindle-shaped, pale yellow with brown spots. It has a rounded front edge. The thorax is made up of relatively compact rings. The second ring is the widest. The legs are equipped with thick curved claws; the back claw is longer than the others. The abdomen is oval in shape and is composed of distinct rings that gradually narrow towards the posterior end. Brown spots on the sides of the third to sixth segments. On the dorsal surface are short hairs on the sides. In females, the genital area is prominent and forms a semi-oval structure surrounded by gonopophyses, which extend in the form of two opposite pairs. This area is covered with short, dense hairs. In the male, there is a genital chamber with a conical shape, to which is attached with a basal apodeme (Figure 5).



Figure 5: *Linognathus africanus* male and female

5- *Damalina ovis*

Materials: 15♀, 6♂. Zubair, Shatt al-Arab, Qurnah.

Diagnostic characters

Body length. Color is pale grey with yellow spots. The head is wide and circular, surrounded by different hairs. The antenna is three pieces; the basal piece is enlarged. The head is connected to the thorax through a short neck. Legs are equipped with strong claws of similar length. In the abdomen, each segment bears some short hairs at the edges of the plates. On the dorsal side, almost similar plates are observed, and the gonopophysis with terminal appendages (Figure 6).

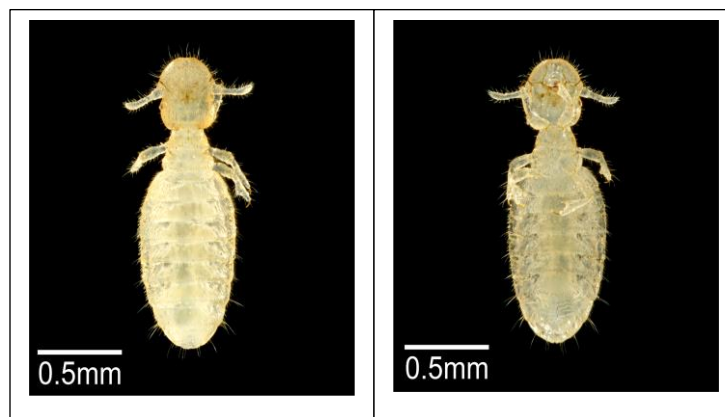


Figure 6: *Damalina ovis* female and male

6- *Damalina caprae*

Materials: 37♀, 12♂. Shatt Al-Arab, Qurnah, Zubair, Basrah City.

Diagnostic characters: Body length, oval-elongated, yellow to yellowish-brown, with dark spots on the abdomen. The body is covered by a layer of short, regular hairs. The head is square in shape, larger than the thorax. The dorsal surface is dotted with many short hairs, with one row of hairs near the base, and its front edge is slightly rounded, with many hairs of different lengths along its length. Antennae are three pieces; the basal segment is enlarged, and the third is slightly larger than the second. The thorax is relatively broad and shorter than the head. The abdomen is oval. On the dorsal surface, dark spots on the third to sixth segments, and short, regular lateral hairs on each segment. Lateral plates are dark brown, with short hairs. In males, the penis is conical in shape. In females, genital protrusions are pronounced and bear a number of short hairs on each side (Figure 7).



Figure 7: *Damalina caprae* male and female

Discussion

The results of the study showed that sheep were infected with four species of sucking lice and two species of chewing lice. This is a high infection rate compared to previous studies in Iraq. (13) recorded in Basrah, one species only of chewing lice, *Damalina ovis*. While (9) recorded two species, *Linognathus* sp. And *D. ovis*. In Dohuk, (14) found two species: *D. ovis* and *L. stenopsis*.

The species *Solenopotes capillatus* diagnosed by the ventral surface of the thorax, stands out with a broad, almost hexagonal plate, and the middle and hind legs are roughly the same length; the front legs are slightly smaller (15). While *L. vituli* is diagnosed with the dorsal surface of the abdomen covered by thin membranous plates, and the lateral plates are completely missing (23). *L. ovis* has an elongated head, a forehead that extends clearly forward, and on its front surface several short, regular hairs observed on the leading edge (24). *L. africanus* was a light yellowish color, with dark spots on the abdomen. Head slender and spindle-shaped, oval abdomen (25). *D. ovis* is diagnosed with a head that is connected to the thorax through a short neck, and its legs are equipped with strong claws of similar length (26). While *D. caprae* is oval-elongated, the head is square in shape, larger than the thorax (27). Antennae are three pieces; the basal segment is enlarged, and the third is slightly larger than the second (28).

The high incidence and diversity of sheep infections are likely due to many important factors, including environmental factors affecting sheep farming, the large crowding in barns, malnutrition, weak breeding systems, weak awareness among farmers, and the lack of adequate veterinary care. In this regard, (21) pointed out that gathering in large numbers of livestock leads to rapid infestation of lice, as well as due to contact during mating and caring for lambs (15). It has also

been shown that most of the sheep breeds currently available are imported, and thus, this may be one of the reasons for the diversity of lice infestations as a result of the entry of new breeds into Iraq (24). It has been shown that sheep are infected with species that infect other animals, such as goats and cows. The reason may be due to the presence of the same barns and the greater use of control and pesticides on cows than on sheep. (22) pointed to reasons similar to those mentioned in explaining the causes of ectoparasite infections among domestic animals.

Conclusion

The current study revealed that sheep are highly susceptible to biting and sucking lice, and also showed a greater diversity of lice species compared to other domestic mammals. The diversity of sucking lice affecting sheep is greater than that of biting lice.

Conflicts of interest

The authors declare that there is no conflict of interest.

Ethical Clearance

This study was approved by the department's Research Ethics Committee, numbered 29 in14/10/2024.

References

1. Slavova, S. (2022). Bio-economic models for deriving economic values for sheep: A review. *Agricultural Science and Technology*, 14 (3), 3–9. [DOI:10.15547/ast.2022.03.031](https://doi.org/10.15547/ast.2022.03.031)
2. Ding, W., Lu, Y., Xu, B., Chen, P., Li, A., Jian, F., Yu, G., & Huang, S. (2024). Meat of sheep: Insights into mutton evaluation, nutritive value, influential factors, and interventions. *Agriculture*, 14(7),1-14. <https://doi.org/10.3390/agriculture14071060>
3. Mazinani, M. & Rude, R. (2020). Population, World Production and Quality of Sheep and Goat Products. *American Journal of Animal and Veterinary Sciences*, 2,1-9. [10.3844/ajavsp.2020.291.299](https://doi.org/10.3844/ajavsp.2020.291.299)
4. World Health Organization. (2008). Microbiological Hazards in Fresh Leafy Vegetables and Herbs: *Meeting Report*, 14(1), 1-154.
5. Food, F. A. O. (2018). Agriculture Organization of the United Nations. FAOSTAT: statistics database.
6. Raynal-Ljutovac, K., Park, Y. W., Gaucheron, F., & Bouhallab, S. (2007). Heat stability and enzymatic modifications of goat and sheep milk. *Small Ruminant Research*, 68(1), 207-220. <https://doi.org/10.1016/j.smallrumres.2006.09.006>

7. Disasa, D. D. (2020). Lice infestations in sheep and goats in Kombolcha district, east Hararghe zone, Oromia regional state, Ethiopia. *Veterinary Medicine International*,20(1),1-4. <https://doi.org/10.1155/2020/8889755>
8. Syamsul, V. S., Okene, I. A., Yahya, S. N., Hamdan, R. H., Lee, S. H. & Tan, P. (2020). Prevalence of ectoparasites on small ruminants in Kelantan, Malaysia. *Tropical life Science Research*,31(1), 1-45. DOI: [10.21315/tlsr2020.31.1.3](https://doi.org/10.21315/tlsr2020.31.1.3)
9. Clodfelter, E. B. (2024). Studies of Phthiraptera (Insecta: Psocodea): From Phylogeny to Fossil. (MSc Thesis.). University of Illinois Urban-Champaign: 51.
10. Nizamov, N. S. & Prelezov, P. N. (2020). First report of Linognathus africanus (Phthiraptera: Anoplura) on goats in Bulgaria. *Bulgarian Journal of Veterinary Medicine*,3(5), 7-14.[10.15547/bjvm.2297](https://doi.org/10.15547/bjvm.2297)
11. Clayton, D. H. & Johnson, K. P. (2003). The Biology, Ecology, Evolution of Chewing Lice. In: Price R. D, Hellenthal, R. A., Plama K. P., Johnson, K. P. and Clayton D.H (Eds.) The chewing lice: World checklist and biological overview. *Illinois Natural History Survey Special Publication*, 53(4), 451-476.
12. Ketzis, J. K. (2023). Overview of lice in animals. *Merck Manual Veterinary Manual*,7 (2),467.
13. Alneema, M. S. & Alhayali, N. S. (2024). Prevalence and associated risk factors of lice in sheep and goats in Mosul City-Iraq. *Egyptian Journal of Veterinary Sciences*,12(5),1-10. [10.21608/ejvs.2024.289022.2083](https://doi.org/10.21608/ejvs.2024.289022.2083)
14. Muhammad, A., Bashir, R., Mahmood M., Afzal, M. S., Simsek, S., Awan, U. A., Khan, M.R., Ahmad, H., & Cao, J. (2021). Epidemiology of ectoparasites (ticks, lice and mites) in the livestock of Pakistan: A review. *Frontiers in Veterinary Sciences. Veterinary Infectious Diseases*, 8(3), 1-9.<https://doi.org/10.3389/fvets.2021.780738>
15. Wall, R. & Shearer, D. (2001). *Veterinary Ectoparasites: Biology, Pathology and control*, (2nd ed.) Blackwell Science: 262.
16. McGavin, G. C. and Davranolou, L. R. (2022). *Essential Entomology*, (2nd ed.), Oxford University Press: 314.
17. Rózsa, L. & Weaver, H. (2024). Phthiraptera (Order): LICE. In: Gardner L.S. and Gardner,S.A(Eds.), *Concepts in Animal Parasitology*. Zea Books, Lincoln, Nebraska, United States: 771-789. DOI:[10.32873/unl.dc.ciap064](https://doi.org/10.32873/unl.dc.ciap064)
18. Durden, L. A. (2019). Lice (Phthiraptera). In: Mullen, G.R and Durden, L.A(Eds.), *Medical and Veterinary Entomology* (3rd ed.). Academic Press: 79-106.
19. Yashizawa, K. & Johnson, K. P. (2006). Morphology of male genitalia in lice and their relatives and phylogenetic implications. *Systematic Entomology* ,31(2), 350-361. DOI:[10.1111/j.1365-3113.2005.00323.x](https://doi.org/10.1111/j.1365-3113.2005.00323.x)
20. Taylor, M. A., Coop, L. & Wall, L. (2016). *Veterinary Parasitology*>. (4th ed.). Willey Black well, New York, USA, :198-211.

21. Service, M. (2012). Medical Entomology for Students (5th ed.) Cambridge University Press, Cambridge :191-202.
22. Park, M. S. & Chang, B. S. (2014). Scanning electron microscopic study on the head lice egg detected in Korean children. Applied Microscopy, *Korean Society of Microscopy* :47-52. [DOI:10.9729/AM.2014.44.2.47](https://doi.org/10.9729/AM.2014.44.2.47)
23. Jacobs, D., Fox, M., Gibbons, L. & Hermsilla, C. (2016). Principles of Veterinary Parasitology. Wiley Blackwell: 726.
24. Karim, D. K. (2006). A taxonomic study of sucking and biting lice on some vertebrates and the epidemiology of head lice in Basra Governorate. Doctoral thesis, College of Science, University of Basra:195.
25. Williams, E. (2010). veterinary entomology livestock and Companion Animals. CRC Press: 91- 118.
26. Price, R. D., Hellenthal, R. A., Palma, K. P., Johnson, K. P. & Clayton D. (2003). The chewing lice: world checklist and biological overview (*Illinois Natural History Survey Special Publication*,24:1- 501.
27. Kim, K. C., & Ludwig, H. W. (1978). The sucking lice of North America: An illustrated manual for identification. University Park, PA: Pennsylvania State University Press, 241.
28. Stojanovich, C., & Thoraxer, J. (1965). Key to Anoplura of North America. US Department of Health, Education, and Welfare, Public Health Service, *Center for Disease Control*, 19.

مسح للقمل (Order: Phthiraptera) المتطفل على الأغنام في محافظة البصرة-العراق.

طلال حاشوش حنفيش وعلاء ناظم حاتم.

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الخلاصة

أجريت الدراسة في محافظة البصرة/جنوب العراق في الفترة من تشرين الثاني 2024 إلى تشرين الأول 2025. تم إجراء مسح القمل في خمس محطات؛ الزبير، القرنة، شط العرب، أبو الخصيب، ومدينة البصرة. وشملت المجموعة المسالخ وحظائر الأغنام والمزارع وأسواق الماشية. تم جمع العينات من مواقع مختلفة من جسم الأغنام، بما في ذلك: الرأس والرقبة والبطن والجذع والأطراف. بلغ العدد الكلي للأغنام التي تم فحصها 414. وأظهرت نتائج المسح أن نسبة الخمج في الأغنام المفحوصة بلغت (48.34%). تم تحديد أنواع القمل بناءً على المفاتيح التصنيفية العالمية المعتمدة بواسطة بعض الخصائص المظهرية. وبينت النتائج ان الأغنام مصابة بستة أنواع من القمل، أربعة منها من القمل الماص وهي: *Solenopotes capillatus* (Enderlein,1904) و *Linognathus vituli* (Kellogg and Paine,1911) و *Linognathus africanus* (Linnaeus,1758) و *Linognathus ovillus* (Neumann,1907) و نوعين من القمل القارض هما: *Bovicola ovis* (Linnaeus,1758) و *Bovicola caprae* (Gurlt,1843). وتم تسجيل النوع *Solenopotes capillatus* في العراق لأول مرة. وكذلك تسجيل الأغنام كمضيف جديد للنوع *Linognathus vituli*، والذي سجل سابقاً على الأبقار فقط.

الكلمات المفتاحية: الأغنام، القمل القارض، القمل الماص.