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ORIGINAL ARTICLE

FIRST RECORD OF CAMEL LICE *MICROTHORACIUS CAMELI* L. 1758 (PHTHIRAPTERA, MICROTHORACIIDAE) IN IRAQ, WITH REDISCRIPTION BY SCANNING ELECTRON MICROSCOPE

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ABSTRACT

The species of *Microthoracius cameli* L., 1758 which belongs to the family Microthoraciidae (Order, Phthiraptera) was recorded for the first time in the insect fauna of Iraq. These specimens were collected from camels in Basrah Province. The work included a detailed description of this species as well as the addition of photographs and illustrations obtained using a scanning electron microscope. The diagnostic characters of this species were provided.

Keywords: Camels, Ectoparasites, Mammals, Microthoraciidae, Sucking lice.

INTRODUCTION

Lice, which belong to the order Phthiraptera, and are obligate ectoparasites on humans, mammals, and birds (Mullen and Durden, 2018). They are characterized by high specificity for the host, and sometimes there is specificity to certain areas of the host body (Nizamov and Prelezov, 2020). Lice live within the environment provided on the host's skin, hair, or feathers and are transmitted mainly through contact between hosts. All stages of the life cycle occur on the host (Johnson and Clayton, 2003). Lice are most abundant during the colder months and are often difficult to find in the summer (Ketzis, 2025). Lice are one of the most prominent and common ectoparasites that infect domesticated animals, cause many symptoms such as skin irritation, itching, weight loss, and decreased animal production (Mullen and Durden, 2018).

Lice pose a threat to the livestock sector both productively and economically, and this threat lies especially in areas where veterinary health care is limited (Muhammad *et al.*, 2021). The greatest risk occurs when parasitic infection is accompanied by other diseases (Nasser,2016). Microthoracidae are represented by one genus which is *Microthoracius* Fahrenholz, 1916. This genus includes four species; three are Neotropical: *Microthoracius*

mazzai (Werneck,1932), *M. minor* (Werneck,1935), and *M. paralongiceps* (Neumann,1909), and only one species is in the Old World, *M. cameli* (Durden and Musser,1994). Previously, these species were included in the family Linognathidae (Kim and Ludwig, 1978). One of the most important characteristics that distinguishes the Microthoraciidae from other lice families is the elongated spindle head, with the antennae consisting of 4-5 segments (Cicchino *et al.*,1998). The abdomen lacks definite tergites, paratergal, and sternal plates (de Hamity *et al.*, 2004). Body shorter with spindle-shaped, whereas elongated in the *M. cameli* (González-Acuña *et al.*, 2007). The antenna has only four segments, while other species containing five segments (Fischer *et al.*, 2025).

The present study aims to describe the species *Microthoracius cameli* for the first time in Iraq that were collected from camels in Basrah Province.

MATERIALS AND METHODS

Collection of Lice: The collection of lice specimens infesting camels was carried out in desert areas in the western and northwestern of Basrah Province. Specimens were collected from different parts of the body through a direct examination of the pile, and then transferred to 70% alcohol to protect them from damage, in addition to a few drops of glycerol to preserve the specimens for as long as possible.

Preparation of permanent slides of lice: Many glass slides were prepared for the morphological identification of lice using a method modified form Price *et al*. (2003).

Identification: Specimens were identified based on morphological characteristics, using the following identification keys: Kim and Ludwig (1978), Durden and Musser (1994), Cicchino *et al.* (1998), and González-Acuña *et al.* (2007). The diagnosis was confirmed by the Iraq Natural History Research Center and Museum at the University of Baghdad, under museum No. PM.51.25.

Examination using a scanning electron microscope: A scanning electron microscope was used to obtain detailed images of morphological characteristics at the Al-Khorah office in Baghdad. A modified method based on Alvarez and Fernandez *et al*. (2021) was followed.

Measuring the prevalence of lice: The prevalence of lice collected from camels was calculated as follows: Prevalence of infestation= Numbers of camels infested with a particular louse ÷ Numbers of examined camels × 100.

RESULTS

Prevalence of *Microthoracius cameli* (Linaeus,1758)

A total of 77 individuals of camels were examined for lice infestation. It was recorded that 13 camels were infested with *M. cameli*, with a prevalence of 16.88%. This species was recorded for the first time in Iraq.

Materials: (13 ♀), Zubayer District (30°23′22″N 47°42′52″E), Basrah Province, April to mid - May 2025.

Diagnostic characters: An elongated, spindle-shaped head that is approximately as long as the abdomen. Filiform antennae. Legs are similar in size and shape. The claw is poorly developed. The tibia has a thick apical bristle. The abdomen is oval, and lacks distinct plates, and is covered with short, thin setae.

Description of *Microthoracius cameli*

The body length of this louse is 3.5-3.7 mm (Pl.1A, B). Head**:** Narrow frontally, spindle-shaped, and elongated. Color goldfish-yellow with brown spots near the eyes. Mandibles have sharp ends; three bristles are located on the sides of the mouthparts (Pl. 2A). Eyes clear, prominent, and rounded-shaped. A pair of double small hairs in front of the eyes. Antenna have four brown segments; basal circular shaped, other segments are rhombic-shaped (Pl. 2B). The last segment has a pair of elongated hairs that are located on the sides with a tuft of sensory papillae numbering 11 (Pl. 2C).

Plate (1): Female of *Microthoracius cameli*; (A) Dorsal view, (B) Ventral view.

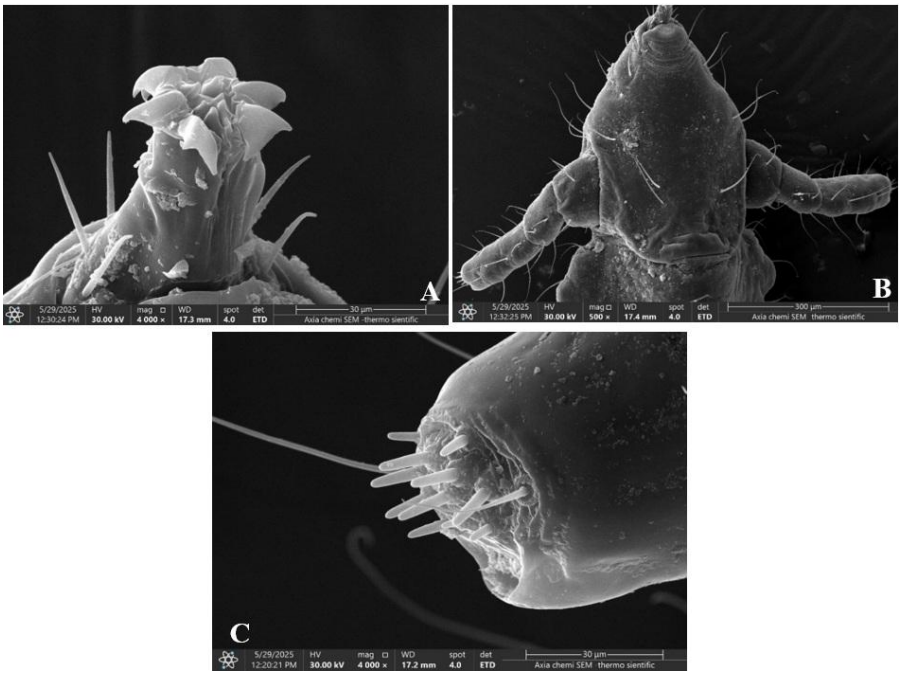

Plate (2): Some head parts of Female of *Microthoracius cameli*; (A) Mouthparts, (B) Antennae, (C) Sensory papillae of in last of antenna.

Thorax: It has small segments. The color is yellowish-brown. Densely covered with medium hairs. The legs are similar in shape and size; the fore and mid coxae are shorter than the hind coxae. The claw of the fore leg has a sharp fork (Pl. 3A). A group of medium hairs is attached to the posterior plates. The spiracles are large, prominent, and circular-shaped (Pl. 3B).

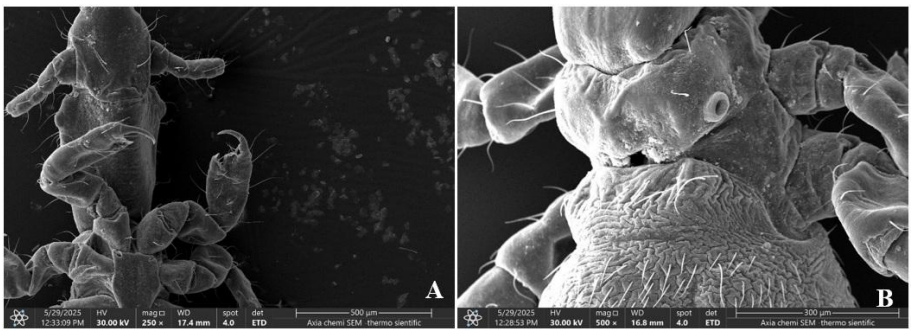

Plate (3): Thorax of female of *Microthoracius cameli*;(A) Legs, (B) Spiracle.

Abdomen: Elongated, oval and wide (Pl. 4A); colour yellowish; peripheral plates absent. Zigzag scales present (Pl. 4C). Hair very thick, short at the middle, and longer on the sides (Pl. 4B), sides of abdomen with six pairs of spiracles; genital plates with poorly developed, genital feet circular and have nine hairs. Apical lobes thin and have three apical hairs (Pl. 4D).

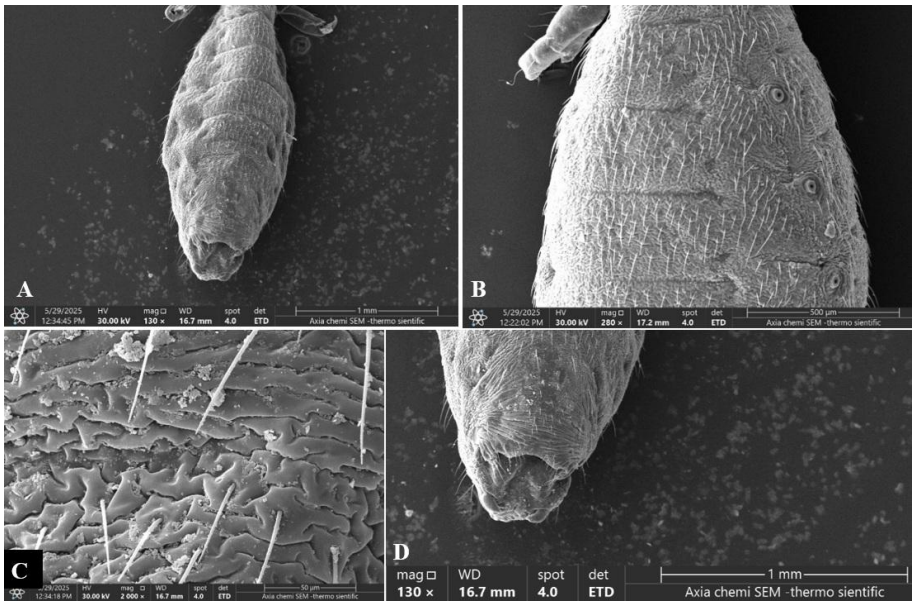

Plate (4): Abdomen of Female of *Microthoracius cameli*; (A) Ventral view, (B) Dorsal view, (C) Scales, (D) Genital plates.

DISCUSSION

Sucking lice infested camels may cause medical conditions such as itching, hair loss, and discomfort. They may also transmit some pathogens such as bacteria and worms (Fisher *et al.*, 2025). Lice infestations, such as mange, are multifactorial diseases that typically arise under conditions of stress, immunosuppression, and increase risk of late infections. Therefore, farm management should always be considered (Hunter *et al.*, 2004). Sucking lice and biting lice are the most present, lice in camelids and are the main cause of pediculosis (Foster *et al.*, 2007). The reason behind the entry of external parasites into places where they were not present may be the transport of animals from one country to another and the lack of adequate health control at ports and outlets (Mullen and Durden, 2018). Transmission via asymptomatic carries and vectors, or undetected infection in the original source herd, cannot be ruled out (Scott *et al.*, 2011) .One successful method is the proper handling new animals, testing them well, and subjecting them to quarantine (Fisher *et al.*, 2025).

CONCLUSIONS

The study confirmed that the morphological identification of sucking lice is a successful and reliable taxonomic method. The use of scanning electron microscopy has significantly increased the accuracy of identification compared to conventional microscopes.

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CONFLICT OF INTEREST STATEMENT

"We declare that have no competing interests".

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تسجيل أول لقمل الإبل ***Microthoracius cameli*** L. 1758 (Phthiraptera, Microthoracidae) في العراق، مع اعادة وصف باستخدام المجهر الالكتروني الماسح

طلال حاشوش حنفيش و علاء ناظم حاتم

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الخلاصة

سجل النوع *Microthoracius cameli* (Linaeus,1758) الذي ينتمي إلى العائلة Microthoracidae (رتبة Phthiraptera) لأول مرة للمجموعة الحشرية في العراق. اذ جمعت عينات هذا النوع من الأبل في محافظة البصرة. وتضمن العمل وصفاً موجزاً لهذا النوع بالإضافة الى صور فوتوغرافية وصور بالمجهر الإلكتروني الماسح.