

First record of *Melophagus ovinus* (Linnaeus, 1758) (Diptera: Hippoboscidae) for Nuevo Leon, Mexico

Primer registro de *Melophagus ovinus* (Linnaeus, 1758) (Diptera: Hippoboscidae) para Nuevo León, México

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ABSTRACT

The sheep ked *Melophagus ovinus* (Diptera: Hippoboscidae: Lipopteninae), an ectoparasite of the domestic sheep *Ovis aries* (Artiodactyla: Bovidae: Caprinae), was recorded for the first time in Nuevo Leon, Mexico. This dipteran has a cosmopolitan distribution, likely found wherever its preferred host is present. Records of this parasite in Mexico are scarce and dispersed throughout the literature.

Key words: Hippoboscoidea, Lipopteninae, sheep ked, sheep, invasive species, geographic distribution.

RESUMEN

La falsa garrapata de las ovejas *Melophagus ovinus* (Diptera: Hippoboscidae: Lipopteninae), un ectoparásito de la oveja doméstica *Ovis aries* (Artiodactyla: Bovidae: Caprinae), fue reportada por primera vez en Nuevo León, México. Este díptero tiene una distribución cosmopolita, probablemente se encuentre donde sea que esté presente su huésped preferido. Los registros de este parásito en México son escasos y dispersos en la literatura.

Palabras clave: Hippoboscoidea, Lipopteninae, falsa garrapata de las ovejas, ovejas, especie invasora, distribución geográfica.

Introduction

Hippoboscoidea is a superfamily of blood-feeding parasitic flies with four families: Glossinidae, known as tsetse flies; Hippoboscidae, known as keds or louse flies; and Nycteribiidae and Streblidae, both known as bat flies. With the notable exception of the exclusively Afrotropical tsetse flies, none are known to commonly target humans as their hosts, and so they have not been recorded as vectors of zoonotic diseases. Hippoboscidae parasitizes both avian and mammalian hosts (Reeves & Lloyd, 2019), and is represented in continental North America by three subfamilies: Hippoboscinae (1 genus – parasite of Carnivora); Ornithomyiinae (9 genera – parasites of various birds), and Lipopteninae (3 genera – parasites of Artiodactyla) (Maa & Peterson, 1987; Wood, 2010).

The three genera of Lipopteninae found in North America are *Lipoptena* Nitzsch, 1818 (3 species – 1 introduced and 2 native parasites of Cervidae), *Melophagus* Latreille, 1802 (1 species – introduced parasite of Bovidae), and *Neolipoptena* Bequaert, 1942 (1 species – native parasite of Cervidae) (Maa & Peterson, 1987). In *Lipoptena* and *Neolipoptena* adults are fully winged, including halteres,

but their forewings are shed after settling on the host (Maa & Peterson, 1987; Reeves & Lloyd, 2019). Adult *Melophagus* emerge from their pupal stage completely wingless, lacking even the halteres. *Melophagus ovinus* (Linnaeus, 1758) (Fig. 1A) is the only species of the genus represented in North America; it is a monoxenous parasite of the domestic sheep *Ovis aries* Linnaeus, 1758, with stray records on other species (Maa, 1964; Maa, 1965; Maa, 1969), particularly, domestic goats *Capra hircus* Linnaeus, 1758 (that are raised alongside sheep) (Bequaert, 1942).

This is a commercially important parasite of sheep wherever it is present, and they have the capacity to transmit various pathogens and thus hamper the production of wool, meat, and milk (Small, 2005). This manuscript reports *Melophagus ovinus* in Nuevo Leon, Mexico, this is the northernmost record in the country for this insect, increasing its known distribution.

Materials and methods

The adult specimens documented here (Fig. 1A) were collected from the wool of a domestic sheep from the locality of “La Escondida” (24°03'06.8" N, 99°57'30.2" W, 1838

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m a.s.l.) in the municipality of Aramberri, Nuevo León, Mexico. They were identified using the keys found in the works of Maa and Peterson (1987) and Wood (2010): the absence of both wings and halteres identifies this genus and species. The specimens are deposited in the Entomology Laboratory of the Facultad de Ciencias Forestales of the Universidad Autónoma de Nuevo León under the voucher FCF-DIPTE003a–d.

Results and discussion

The four specimens collected (Fig. 1A) corresponded to *Melophagus ovinus* and represent the first records of this economically important parasite from the state of Nuevo Leon (Fig. 1B). Records of *Melophagus ovinus* from Mexico are scarce, since its preferred host species does not thrive in hot or tropical climates; however, it can be found in

cooler areas in the highlands of the country (Bequaert, 1942; Maa, 1964; Wood, 2010). Previously, *Melophagus ovinus* had been recorded in the states of Chiapas, Estado de Mexico, Guanajuato, and Hidalgo (Fig. 1B; see Tab. 1 for references). *Melophagus ovinus* causes chronic irritation and dermatitis with associated pruritus in the sheep it infects (Underwood *et al.*, 2015), and it is a vector of the protozoan *Trypanosoma melophagium* and the bacteria *Rickettsia melophagi*, both non-pathogenic, as well as viruses of the genus *Orbivirus* that are the causative agents of bluetongue disease (Reeves & Lloyd, 2019) and many other microorganisms (Zhao *et al.*, 2018; Werszko *et al.*, 2021). Nuevo Leon is not a leading Mexican state for the rearing and breeding of sheep (Hernández-Marín *et al.*, 2017), but the activity is present in the state, at a moderate level. Future studies should focus on monitoring the populations dynamics of *Melophagus ovinus* to establish

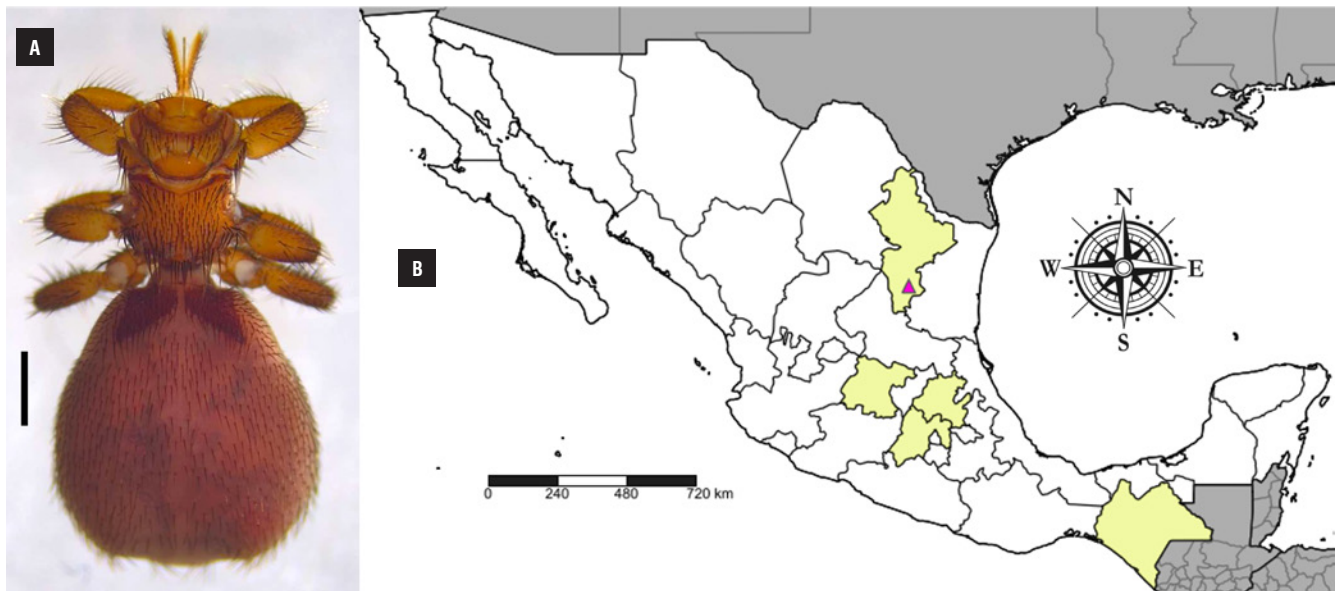


FIGURE 1. Sheep ked *Melophagus ovinus* (Linnaeus, 1758). A) adult male specimen (specimen FCF-DIPTE003a), dorsal view, scale bar = 1 mm; B) map of Mexico showing states from which *Melophagus ovinus* has been recorded (including the new record) in pale yellow; the pink triangle indicates the locality of the new record.

TABLE 1. State records of sheep ked (*Melophagus ovinus*) from Mexico from the available literature, including region and references. All hosts are domestic sheep (*Ovis aries*).

State	Region of Mexico	References
Chiapas	Southern	Perezgrovas Garza and Pedraza Villagómez (2014); Alemán Santillán <i>et al.</i> (2001)
Estado de Mexico	Central	Cuéllar Ordaz (2003)
Guanajuato	Central	Bequaert (1942)
Hidalgo	Central	Ayala Castillo (1991)
Nuevo Leon	Northern	Present publication

Material examined: *Melophagus ovinus* (Linnaeus, 1758), 2♂♂ 2♀♀, Mexico, Nuevo Leon, Aramberri, La Encantada, 24°03'06.8" N and 99°57'30.2" W, 1838 m a.s.l., 11-Feb-2023, ex. *Ovis aries* (Bovidae) [DIPTE003a–d].

its prevalence among the sheep to generate management strategies. Another possible research focus is to study the microorganisms present in these parasites as well as those in infected livestock.

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Conflict of interest statement

The authors declare that there is no conflict of interests regarding the publication of this article.

Author's contributions

MJH thought of the goals and aims of this publication. MdL identified the specimen to the level of genus and species. MdL wrote the article. MJH corrected the initial version. Both authors reviewed the final version of the manuscript.

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