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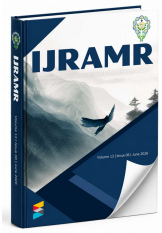

REVIEW ARTICLE

FIRST REPORT OF COCHLIOMYIA MACELLARIA CAPTURED IN CHROMATIC TRAPS IN THE MEZQUITAL VALLEY REGION, HIDALGO, MEXICO

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ABSTRACT

The screwworm is an obligate parasite of mammals, and its zoonotic importance is significant because it can infest young children, the elderly, and the sick. In this study, dipteran sampling was conducted using sticky white chromatic screens arranged vertically in sheep fattening pens in the Mezquital Valley, Hidalgo. The fly captured was identified as *Cochliomyia macellaria*. This initial record is important because producers should implement control measures in their flocks to prevent myiasis caused by this insect.

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INTRODUCTION

The New World screwworm flybelongs to the order Diptera, family Calliphoridae, commonly known as blowflies or bluebottles. It is an obligate parasite of mammals and rarely of birds. Its zoonotic importance is considerable because humans, especially young children, the elderly, and the sick, can become infested, with serious and sometimes fatal consequences (OMSA Organización Mundial de Sanidad Animal, 2019). Sheep production in the Mezquital Valley of Hidalgo State, Mexico, is dynamic and economically important, providing a livelihood for thousands of families who use this livestock in traditional methods, transforming it into barbacoa. Hidalgo State ranks second nationally in sheep inventory and lamb production. The preliminary production volume for 2024 is 6,853 tons, with a value of 699 million pesos (SIAP, 2025). Cattle screwworm myiasis is caused primarily by *Cochliomyia hominivorax* and secondarily by *Cochliomyia macellaria* (Arteaga et al., 2012). This pest is of sanitary importance in the American continent, especially in South American and Caribbean countries.In Mexico, screwworm had been reported as an exotic disease thanks to control and eradication campaigns in the last century, but the first case in the state of Chiapas was reported in November 2024, in cattle. The Mexico-United States Commission for the Prevention of Foot-and-Mouth Disease and Other Exotic Animal Diseases has reported a total of 16,849 cases of screwworm in cattle, of which 11,491 have been identified in cattle, 2,554 in dogs, 988 in swine, 806 in horses, 441 in sheep, 108 in goats, 72 in domestic cats, 21 in poultry, 4 in captive animals, 3 in wild animals, and 1 in leporids (CPA, 2026).Likewise, the National Epidemiological Surveillance System has reported a cumulative total of 253 cases and two deaths from myiasis caused by *C. hominivorax* in humans during epidemiological week 14 (SINAVE, 2026). This research presents the first scientific report of *Cochliomyia macellaria* captured in sticky traps in the Mezquital Valley Region.

MATERIALS AND METHODS

Diptera sampling was carried out using 30 x 100 cm white sticky chromatic screens arranged vertically at a height of 150

cm from the ground and placed equidistantly in sheep fattening pens (Figure 2) (Williams, 1973) (Graeper Thomas et al., 2016), (Bravo Portocarrero et al., 2020), in the municipality of Actopan, Hidalgo, Mexico, belonging to the Valle del Mezquital region made up of 27 municipalities (Figure 1), which are characterized by a semi-desert climate, very hot during the day and with low temperatures at night.There is little rainfall and the vegetation is mainly xerophytic. Located at 2016 meters above sea level, the average temperature is 16.5ºC; during January, the coldest month, a minimum temperature of 2.6ºC is recorded, and 29.4ºC as the maximum temperature in May. The accumulated annual rainfall is 385.5 mm (CONAGUA, 2026). During the month of March 2026, the specimens were subsequently recovered in a 70% alcohol solution and taken to the Entomology Laboratory of the Polytechnic University of Francisco I. Madero for identification using a LEICA EZ24® stereoscope, according to the methodology proposed by the World Organisation for Animal Health (OMSA, 2019).

Figure 3 describes *Cochliomyia macelarria* Fabricius, which has the characteristic bottle-green color of the Calliphoridae family, measures approximately 10 mm, has three longitudinal black bands in a craniocaudal direction on the thorax and presents chaetotaxy in the major vein of the posterior dorsal surface. Unlike *C. hominivorax*, which is an obligate parasitic species that lays its eggs in wounds of live animals, this species, known as the secondary fly of the cattle screwworm, deposits its eggs in carrion or dead tissue, and is also reported as facultative, since it causes secondary myiasis (Akhoundi et al., 2023).

The secondary fly of the Cattle Screwworm, *C. macellaria*, is common in tropical America. Its distribution overlaps with that of *C. hominivorax*, and they are morphologically very similar, making identification difficult and posing a challenge for control programs implemented through the release of sterile flies. They share similarities in their mature and early

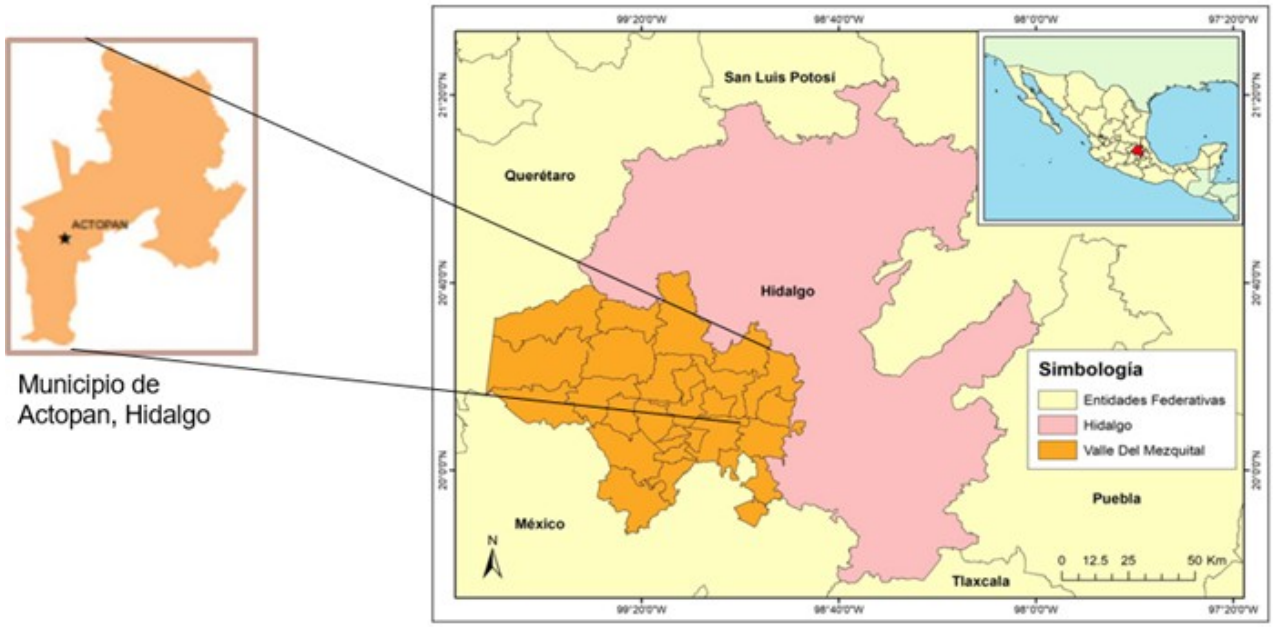

Figure 1. Location of the municipality of Actopan in the macroregion of the Mezquital Valley, adapted from Aguilar Sánchez and González Vizcarra, 2019

The flocks are composed of the following breeds: Dorper, Dorper x Katahdin, Katahdin, Pelibuey, Suffolk, Criollo, Charolais, as well as commercial crosses of these breeds with Criollo sheep. The lambs are fed ad libitum on agricultural byproducts such as corn stalks and commercial feed. The fattening period lasts from 40 to 80 days or until they reach 40 to 50 kg of live weight. At the beginning of this period, they are treated with commercial antiparasitics (1% ivermectin or 5% Closantil) and B vitamins.

RESULTS AND DISCUSSION

A total of 1929 dipteran specimens were collected, of which four had morphological characteristics of the family Calliphoridae and the rest of the family Muscidae, representing 0.2% of the total. This finding confirms that flesh flies can exhibit synanthropic behavior, similar to species of muscidae (Geden et al., 2021).

larval stages, unlike *C. hominivorax, C. macellaria* feeds primarily on dead tissue (Toledo Perdomo and Skoda Steven, 2020). It has been noted that when it parasitizes necrotic tissue of live animals, it contributes to the severity of the existing lesion, but it does not develop in deep areas of living tissue like *C. hominivorax*; that is, it affects secondary tissues, remaining on the surface of the wound (Toledo Perdomo, 2007). The biological cycle of C. macellaria is described in Figure 4, where the longevity of the adults is two to six weeks, they visit carrion, dead animals, garbage deposits, fallen fruit, the females oviposit up to 1000 eggs in batches of 40 to 250, under optimal conditions they hatch two hours after oviposition, and the larval development develops in a period of six to 20 days, subsequently the larvae fall to the ground, where they pupate and remain in metamorphosis for 3 to 27 days, finally the total average period is 39 days (Toledo Perdomo, 2007). Table 1 shows that *C. macellaria* is responsible for a significant percentage of myiasis cases in animals in Mexico, as reported by the CPA in its March 2026

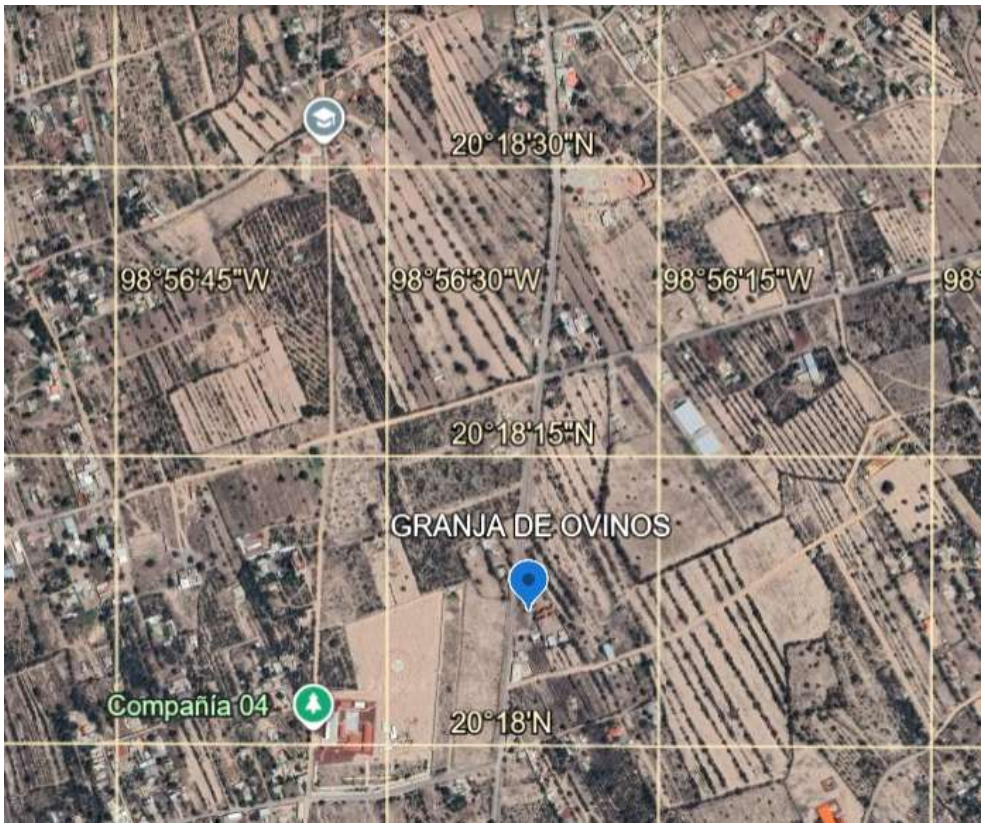

Figure 2. Location of the study farm (taken from https://earth.google.com)

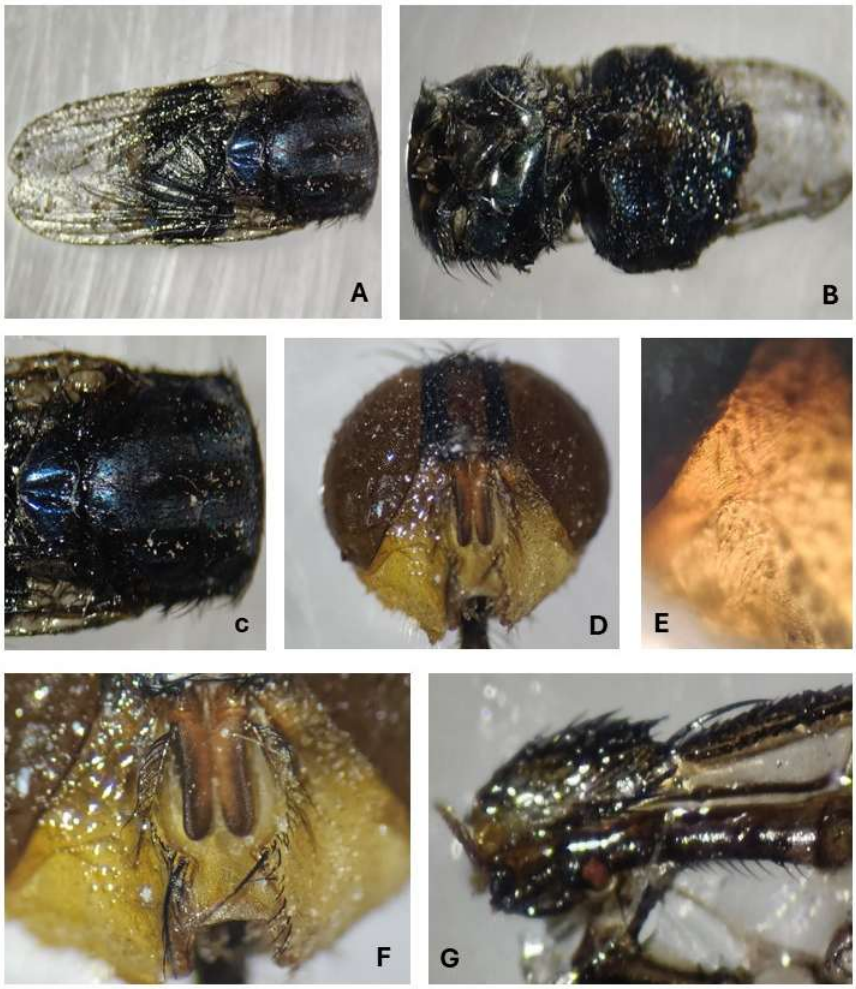

Figure 3. Morphology of the cattle worm fly (Cochliomyia macellaria), A) Membranous wings and dorsal part of the thorax, B) Ventral view of the thorax and abdomen, C) Scutellum, D) Front part of the head, E) Yellow hairs on the forehead of the head, F) Antennae and G) Basal part of the wing at the junction with the thorax

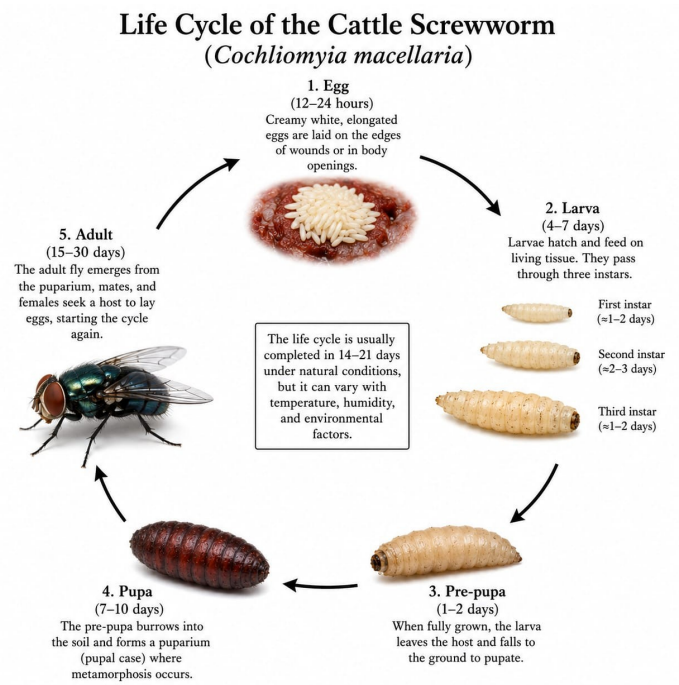

Figure 4. Biological cycle of the cattle fly *Cochliomyia macellaria* (Image created with ChatGPT Artificial Intelligence)

Table 1. Main species of diptera identified that cause screwworm myiasis (CPA, 2026)

Species	Quantity
Cocliomyia hominivorax	15, 690
Lucilia sericata	520
***Lucilia* sp.**	294
Cochliomyia macellaria	262
Cochliomyia megacephala	151
***Sarcophaga* sp.**	148
Lucilia cuprina	138
Dermatobia hominis	109
Musca domestica	63
Phormia regina	60
Chrysomya rufifacies	58
Calliphorida	51
***Phormia* sp.**	40
Total	17, 584

progress report. The following types of wounds infested with myiasis were reported: navel wounds in newborns (4,297 cases), trauma wounds (4,214), barbed wire wounds (1,494), fights between conspecifics (1,356), bat bites (938), vulvar wounds (549), ear tagging (546), arthropod wounds (528), dehorning (474), papillomatosis (461), dermal lesions, hoof wounds (425), branding and hoof marking (204), prepuce wounds (153), castration wounds (132), otitis (121), anal region wounds (97), neoplasia (34), and oral cavity wounds (29). and 9 others (CPA, 2026).

CONCLUSION

It was concluded that the fly captured in white sticky traps is *Cochliomyia macellaria*. This first record is important because producers must implement control measures in their herds to prevent screwworm myiasis, an infestation that has caused economic losses in Mexican livestock farming.

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