



Synopsis of the Mesembrinellidae (Diptera: Oestroidea) from Honduras

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Abstract: Mesembrinellidae (Diptera: Oestroidea) is a family of medium size (7–17 mm) neotropical flies. The taxonomic status of the group has been debated but at present it is treated as a family with 53 extant species. Currently, 19 species are recorded in Central America and Mexico with, until now, only two species known from Honduras: *Mesembrinella bicolor* (Fabricius, 1805) and *Souzalopesiella facialis* (Aldrich, 1922). For this study, material from the Insect Collection at the Pan-American Agricultural School, Zamorano (EAPZ), was examined. Six species distributed in three genera were found to occur in Honduras. The genus *Laneella* and the species: *Laneella fuscusquamata* Whitworth, 2019, *Laneella perisi* (Mariluis, 1987), *Mesembrinella nigrocoerulea* Whitworth, 2019, and *Mesembrinella socors* (Walker, 1861), are recorded for the country for the first time. All species are illustrated, and a map with the known distribution in Honduras is provided.

Keywords: Central America; diversity; Neotropics; new records; flies; taxonomy.

Sinopsis de los Mesembrinellidae (Diptera: Oestroidea) de Honduras

Resumen: Mesembrinellidae (Diptera: Oestroidea) es una familia de moscas neotropicales de tamaño mediano (7–17 mm). El estatus taxonómico del grupo ha sido objeto de debate, pero actualmente se considera como una familia con 53 especies. Hasta el momento, se han registrado 19 especies en Centroamérica y México con solo dos especies conocidas en Honduras: *Mesembrinella bicolor* (Fabricius, 1805) y *Souzalopesiella facialis* (Aldrich, 1922). En este estudio, se examinó el material de la Colección de Insectos de la Escuela Agrícola Panamericana, Zamorano (EAPZ). Se encontraron seis especies distribuidas en tres géneros en Honduras. Se registra por primera vez para el país el género *Laneella* y las especies *Laneella fuscusquamata* Whitworth, 2019, *Laneella perisi* (Mariluis, 1987), *Mesembrinella nigrocoerulea* Whitworth, 2019, y *Mesembrinella socors* (Walker, 1861). Se ilustran todas las especies y se proporciona un mapa de distribución para las especies en Honduras.

Palabras-clave: Centroamérica; diversidad; moscas; Neotrópico; nuevos registros; taxonomía.

Introduction

Mesembrinellidae (Diptera: Oestroidea) is a group composed of 53 extant (Whitworth & Yusseff-Vanegas 2019) and one extinct species (Cerretti et al. 2017). Mesembrinellids are medium size flies ranging from 7–17 mm currently distributed into three subfamilies: Laneellinae, Mesembrinellinae, and Souzalopesiellinae (Whitworth & Yusseff-Vanegas 2019). The group is restricted to the neotropical region and is distributed from southern Mexico to northern Argentina (Whitworth & Yusseff-Vanegas 2019, Dufek & Mulieri 2023). Moll (2014) hypothesized that Mesembrinellidae originated in an area in central South America and dispersed to adjacent areas and Central America.

Very little is known about the biology of the species. Of the 53 species known only 15 have their immature stages described. Mello

(1967) described the immatures of *Mesembrinella apollinaris* Séguy, 1925, *M. batesi* Aldrich, 1922, *M. bellardiana* Aldrich, 1922, *M. bicolor* (Fabricius 1805), *M. peregrina* Aldrich, 1922, *M. quadrilineata* (Fabricius 1805), *M. semihyalina* Mello, 1967, and *Souzalopesiella facialis* (Aldrich 1922). Ten years later Guimarães (1977) described the larvae of *Laneella nigripes* Guimarães, 1977, *M. aeneiventris* (Wiedemann 1830), *M. benoisti* (Séguy 1925), *M. latifrons* (Mello 1967), *M. peregrina* Aldrich, 1922, *M. purpurata* Aldrich, 1922, and *M. randa* (Walker 1849).

Adult Mesembrinellidae are mainly attracted to animal carrion and are considered of use in forensic entomology (Oliveira et al. 2016). Adults have also been attracted to bananas and human feces (Façanha et al. 2020, Souza et al. 2021). Specimens are most commonly collected in bait-based traps like Van Someren-Rydon traps (Barbosa et al. 2014,

Dufek & Mulieri 2023) and variations of Ferreira (1978) but Malaise traps can also be used (Souza et al. 2021).

The first species of Mesembrinellidae from Central America were described by Aldrich (1922, 1925) and Hall (1948). Nineteen species have been recorded in Central America and southern Mexico, with the highest diversity being found in Costa Rica (Whitworth & Yusseff-Vanegas 2019). For Honduras *Mesembrinella bicolor* and *Souzalopesiella facialis*, were recorded by Guimarães (1977); no further species have been recorded in the country since.

Insect diversity in Honduras is understudied for most groups. Factors such as the lack of taxonomists and collections make it very hard for local scientists to advance in their knowledge of the country's diversity. The objectives of this work were: to explore the diversity and distribution of the Mesembrinellidae from Honduras, and to illustrate all the recorded species with the purpose of aiding future workers in their identification.

Materials and Methods

Material was examined from the Insect Collection at the Pan-American Agricultural School, Zamorano (EAPZ). Male and female genitalia were dissected, when necessary, by gently separating the abdomen from the thorax. The abdomen was later introduced into a 10% KOH solution for 24 hours and cleaned afterwards with distilled water. The genitalia and sternites were separated with entomological pins and studied under a stereoscope at 70x. Microcentrifuge 0.6 mL tubes with glycerin were used to store the genitalia and sternites under each insect while the tergites were reattached to the specimen. The material was identified by using the key by Whitworth & Yusseff-Vanegas (2019).

Adults were photographed using a Canon EOS Rebel T5i mounted on a Leica EZ4 stereoscope at 32x–50x. Stacks from different body regions composed of around 20 photos each were merged to produce an individual image. Composite images were obtained by using PICOLAY (<http://www.picolay.de>). Individual images were later merged and edited with Adobe Photoshop® CS5 v. 22.1.1. SimpleMappr (<https://www.simplemappr.net/>) was used to build the species distribution map and Microsoft Powerpoint® v. 2401 to edit the resulting map.

Results

A total of 62 specimens were examined. Three genera and six species are now known from Honduras (Table 1). The genus *Laneella* and four species are recorded for the first time in Honduras: *Laneella fuscusquamata* Whitworth, 2019, *L. perisi* (Mariluis 1987), *Mesembrinella nigrocoerulea* Whitworth, 2019, and *M. socors* (Walker 1861).

Mesembrinellidae

Laneellinae

Laneella fuscusquamata Whitworth, 2019. *Figure 1A*.

Material examined ($n=14$): HONDURAS – **Cortés** • 1 ♀; Cofradía 5 km O Buenos Aires, Parque Nacional Cusuco; 22 Nov. 1994; R. Cordero leg. – **Francisco Morazán** • 1 ♀; Tegucigalpa, Parque Nacional La Tigra; 12–23 Nov. 1994; R. Cordero leg. • 5 ♀♀; same location;

Table 1. Diversity of Mesembrinellidae in Honduras and their known distribution.

Taxon	Distribution
LANEELLINAE	
<i>Laneella fuscusquamata</i> Whitworth, 2019	Guatemala, Mexico (Whitworth & Yusseff-Vanegas 2019), and Honduras (new record).
<i>Laneella perisi</i> (Mariluis 1987)	Brazil, Ecuador (Bonatto 2001), Colombia, Costa Rica, French Guiana (Whitworth & Yusseff-Vanegas 2019), and Honduras (new record).
MESEMBRINELLINAE	
<i>Mesembrinella bicolor</i> (Fabricius 1805)	Argentina (Dufek & Mulieri 2023), Bolivia, Brazil, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Honduras, Mexico, Panama, Peru, Suriname, Trinidad, and Venezuela (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella nigrocoerulea</i> Whitworth, 2019	Costa Rica, Ecuador, Venezuela (Whitworth & Yusseff-Vanegas 2019), and Honduras (new record).
<i>Mesembrinella socors</i> (Walker 1861)	Nicaragua (Hall 1948), Brazil (Bonatto 2001), Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Panama (Whitworth & Yusseff-Vanegas 2019), and Honduras (new record).
SOUZALOPESIELLINAE	
<i>Souzalopesiella facialis</i> (Aldrich 1922)	Costa Rica, Ecuador, Panama, Venezuela (Whitworth & Yusseff-Vanegas 2019), Guatemala, Honduras (Guimarães 1977), and Trinidad (Bonatto 2001).

3 Jan. 1995; R. Cordero leg. • 1 ♀; same location; 19 Jan. 1995; R. Cordero leg. • 1 ♀; same location; 29 May 1995; R. Cordero leg. • 5 ♂♂; same location; 29 May 1995; R. Cordero leg.

Laneella perisi (Mariluis 1987). *Figure 1B*.

Material examined ($n=6$): HONDURAS – **Atlántida** • 1 ♂; Parque Nacional Pico Bonito, estación CURLA; 4 Feb. 2001; 15°42'N, 86°51'W, 175 m; F. Martínez leg.; 57.492EAPZ – **Comayagua** • 5 ♀♀; PANACAM; 25 Jun. 2023; Estudiante EAPZ leg.; nocturnal fruit trap.

Mesembrinellinae

Mesembrinella bicolor (Fabricius 1805). *Figure 1C*.

Material examined ($n=29$): HONDURAS – **Atlántida** • 3 ♀♀; Parque Nacional Pico Bonito, estación CURLA; 15°42'N, 86°51'W, 175 m; 31 Jan. 2001; F. Martínez leg.; 57.488EAPZ • 2 ♀♀; same location; 4 Feb. 2001; F. Martínez leg.; 57.489EAPZ • 1 ♀; same location; 25 Mar. 2002; F. Martínez leg.; 83.883EAPZ • 1 ♀; same location; 30 Jun. 2002;

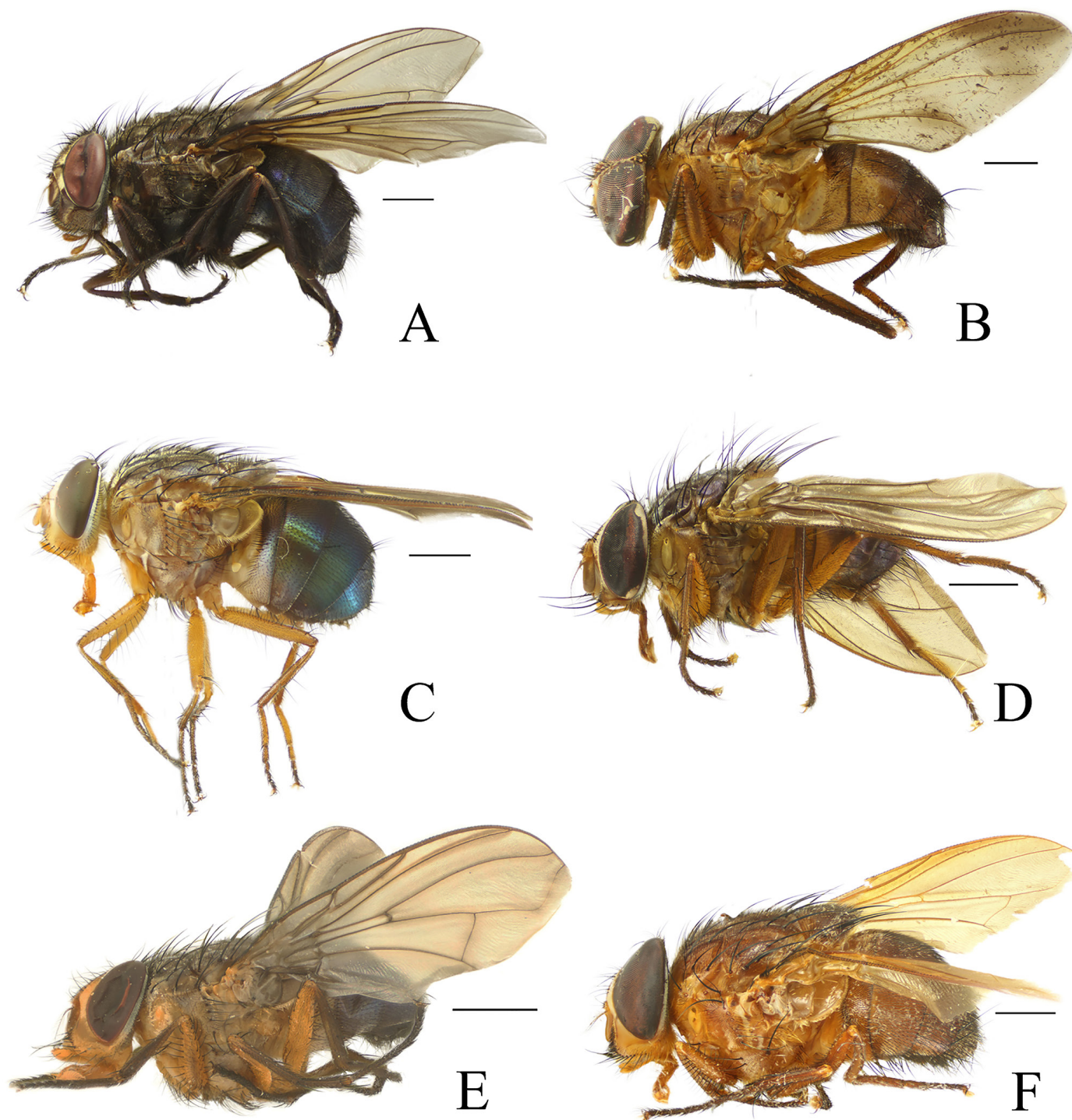


Figure 1. Mesembrinellidae from Honduras in lateral view. **A.** *Laneella fuscusquamata* Whitworth, 2019 female. **B.** *Laneella perisi* (Mariluis 1987) male. **C.** *Mesembrinella bicolor* (Fabricius 1805) female. **D.** *Mesembrinella nigrocoerulea* Whitworth, 2019 male. **E.** *Mesembrinella socors* (Walker 1861) female. **F.** *Souzalopesiella facialis* (Aldrich 1922) male. Scale bar: 2 mm.

F. Martínez leg.; 86.016EAPZ – **Comayagua** • 1 ♀, 1 ♂; PANACAM; 23 Jun. 2023; Estudiante EAPZ leg.; fruit trap – **Cortés** • 1 ♀; Cofradía, 5 km W Buenos Aires, Parque Nacional Cusuco; 22 Nov. 1994; R. Cordero leg. • 1 ♀; same location; 5 Jan. 1995; R. Cordero leg.; malaise trap • 1 ♀; Parque Nacional Cusuco; 15°29'N, 85°13'W; 30 May 1995; R. Cordero leg.; malaise trap • 1 ♂; Cofradía, Buenos Aires; 5 Nov.

1994; R. Cordero leg. – **Francisco Morazán** • 1 ♂; Zamorano 30 km E Tegucigalpa; 9 Apr. 1971; E. Nova, A. Suazo leg.; mango crops • 1 ♂; same location; 7 May 1981; Cosenza-R. Cruz leg.; citrus foliage, 9:00 am, Horticultura • 1 ♂; same location; 17 Jun. 1984; Arroyo-Flaquez leg. • 1 ♀; El Zamorano; 14°01'N, 84°00'W, 850 m; 26 Jan. 2001; G. Andino V. Cáceres; 58.914 EAPZ • 1 ♂; same location; 1 Apr. 2001;

K. Molina Leg.; 58.960EAPZ • 1 ♂; Parque Nacional La Tigra; 11 Jun. 2016; J. Orozco leg.; pig dung pitfall • 1 ♀; San Antonio de Oriente, Jicarito; 29 Jan. 2024; M. Michel leg.; inside a house – **Olancho** • 3 ♀♀; La Unión, Parque Nacional La Muralla; 14 Sep. 1994; R. Cordero leg. • 1 ♀; Parque Nacional La Muralla, Zona Núcleo; 1460 m; Nov. 1994; R. Cordero leg.; FIT trap. • 1 ♀; same location; Dec. 1994; R. Cordero leg. • 4 ♀♀; Parque Nacional La Muralla; Apr. 1995; 1460 m; R. Cordero leg.

Mesembrinella nigrocoerulea Whitworth, 2019. *Figure 1D.*

Material examined ($n = 4$): HONDURAS – **Cortés** • 1 ♀, 1 ♂; 5 km W Buenos Aires, Parque Nacional Cusuco; 22 Nov. 1994; R. Cordero leg. • 1 ♂; same location; 9 Dec. 1994; R. Cordero leg. • 1 ♂; same location; 25 Jan. 1995; R. Cordero leg.; malaise trap.

Mesembrinella socors (Walker 1861). *Figure 1E.*

Material examined ($n = 1$): HONDURAS – **Comayagua** • 1 ♀; PANACAM; 23 Jun. 2023; Estudiante EAPZ leg.; fruit trap.

Souzalopesiellinae

Souzalopesiella facialis (Aldrich 1922). *(Figure 1F).*

Material examined ($n = 8$): HONDURAS – **Atlántida** • 1 ♀; Parque Nacional Pico Bonito, estación CURLA; 15°42'N, 86°51'W, 175 m; 25 Mar. 2002; F. Martínez leg.; 83.882EAPZ • 1 ♀; same location; 20 Apr. 2002; F. Martínez leg.; 83.221EAPZ • 1 ♀; same location;

28 Jun. 2002; F. Martínez leg.; 86.014EAPZ • 1 ♂; same location; 25 Mar. 2002; F. Martínez leg.; 83.881EAPZ • 1 ♂; same location; 15°41'35"N, 86°55'58"W; 19 Dec. 2000; F. Martínez; 57.322EAPZ – **Comayagua** • 2 ♀♀; PANACAM; 25 Jun. 2023; Estudiante EAPZ leg.; night air trap fruit – **Yoro** • 1 ♂; Parque Nacional Pico Bonito, El Portillo; 15°26'27"N, 87°08'09"W, 640 m; 26 May. 2000; R. Reyes leg.; 51.247EAPZ.

Discussion

Honduras with six recorded species is now placed third in known diversity of Mesembrinellidae in Central America. The highest diversity in the region is found in Costa Rica with 16 species, followed by Panama (7), Guatemala (3), Nicaragua (2), and El Salvador (1) (Whitworth & Yusseff-Vanegas 2019).

Mesembrinella bicolor (Fabricius 1805) was the most abundant species in the collection. In Honduras, this species has been found attracted to pig dung and fermented banana in protected, semirural, and agricultural areas. In Brazil, *M. bicolor* has been found primarily attracted to rotten meat and less frequently to fruits and tree sap in well preserved forests and forest fragments near urbanized areas (Boff et al. 2008).

Both *Laneella perisi* (Mariluis 1987) and *M. socors* (Walker 1861) were found on fruit traps baited with fermented bananas.

Only six out of Honduras' 18 departments, or administrative regions, were represented in the examined material (Figure 2). Five

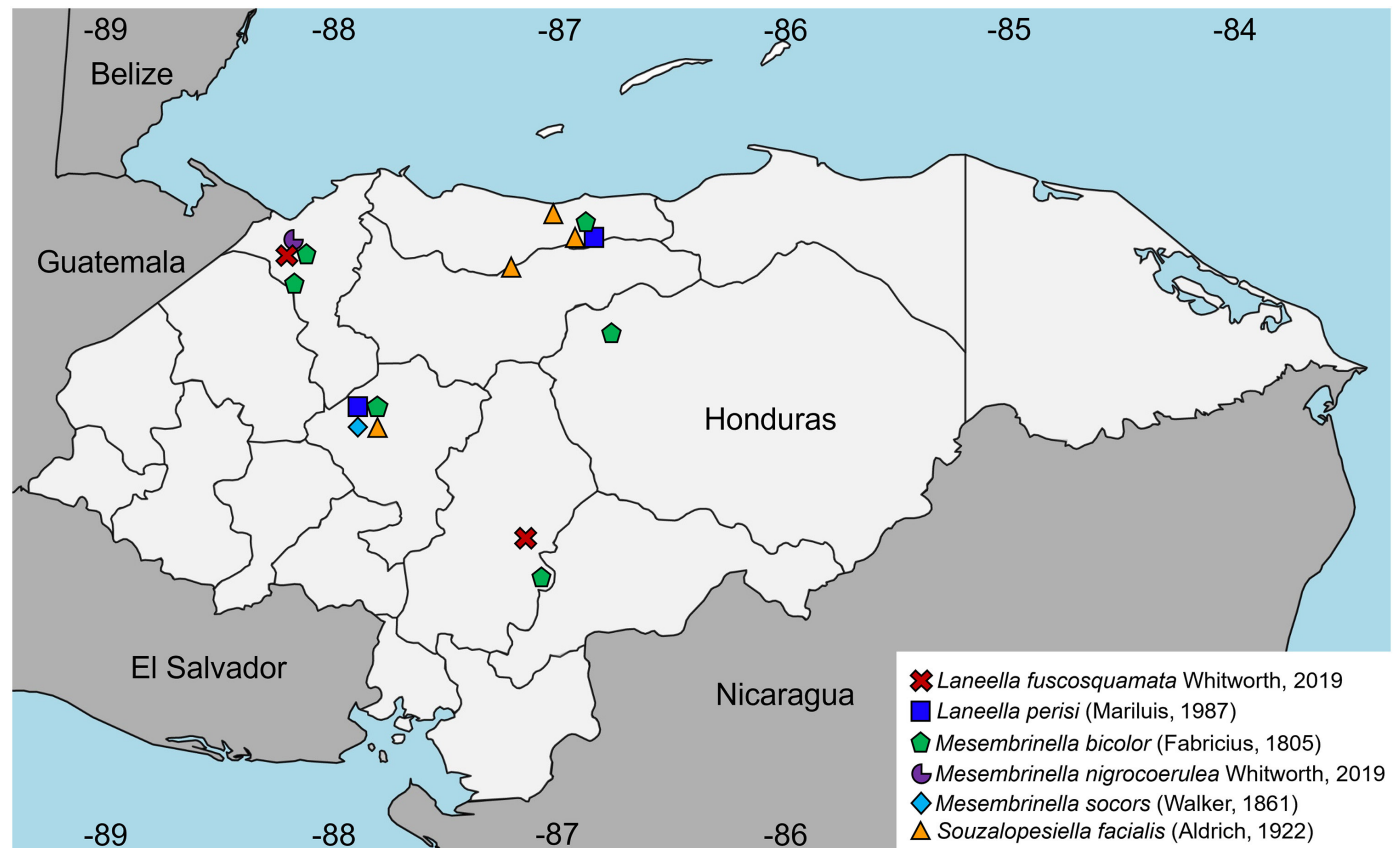


Figure 2. Distribution of Honduran Mesembrinellidae.

Table 2. Species of Mesembrinellidae expected to occur in Honduras and their currently known distribution.

Taxon	Distribution
LANEELLINAE	
<i>Laneella fusconitida</i> Whitworth, 2019	Costa Rica, Ecuador, and Venezuela (Whitworth & Yusseff-Vanegas 2019).
<i>Laneella purpurea</i> Whitworth, 2019	Costa Rica (Whitworth & Yusseff-Vanegas 2019).
MESEMBRINELLINAE	
<i>Mesembrinella aeneiventris</i> (Wiedemann 1830)	Brazil (Whitworth & Yusseff-Vanegas 2019), Colombia, Costa Rica, Ecuador, Panama, and Peru (Guimarães 1977).
<i>Mesembrinella flavicrura</i> Aldrich, 1925	Costa Rica and Panama (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella pictipennis</i> Aldrich, 1922	Bolivia, Ecuador (Whitworth & Yusseff-Vanegas 2019), Colombia, and Costa Rica (Marinho et al. 2017).
<i>Mesembrinella semiflava</i> Aldrich, 1925	Costa Rica and Ecuador (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella spicata</i> Aldrich, 1925	Costa Rica, Mexico and Nicaragua (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella umbrosa</i> Aldrich, 1922	Costa Rica, Ecuador (Whitworth & Yusseff-Vanegas 2019), Colombia, and Panama (Marinho et al. 2017)
<i>Mesembrinella unisetata</i> Aldrich, 1925	Costa Rica (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella violacea</i> Whitworth, 2019	Costa Rica (Whitworth & Yusseff-Vanegas 2019).
<i>Mesembrinella zurquiensis</i> Whitworth, 2019	Costa Rica (Whitworth & Yusseff-Vanegas 2019).

of the six species were recorded only in protected areas probably due to collecting bias. Based on their distribution in neighboring countries, eleven additional species are expected to occur in Honduras (Table 2).

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Katerin Veroy: Resources, Methodology, Writing – review & editing.

Jesus Orozco: Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Conflicts of Interest

The author(s) declare(s) that they have no conflict of interest related to the publication of this manuscript.

Ethics

This study did not involve human beings and/or clinical trials that should be approved by one Institutional Committee.

Data Availability

Data compiled from the published literature are appropriately cited in the references. The datasets generated during and/or analyzed during the current study are available at: <https://doi.org/10.48331/scielodata.TWHD5L>

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