

MiniReview

Investigation of the Characteristics of the Milichiidae Family (Arthropoda: Insecta: Diptera)

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Abstract

Most Milichiidae species are very small and dark. Details of their biology have not been properly studied. It is known that the Milichiidae are associated with decomposing plant and animal matter, including animal and human corpses, a reason that has potential importance in their forensic importance; several species are myrmecophilous predators, pollinators and phoretic vectors. This journal aimed to investigate the bioecology, the bionomy, the biography and systematics of the Milichiidae family (Arthropoda: Insecta: Diptera). The research was carried out based on its systematic aspects and family characteristics. The review was inventoried from works published in national and international journals.

Keywords: decomposition, kleptoparasites, foresy, forensics entomology

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1 INTRODUCTION

Milichiidae is a family of Diptera Milichiidae Meigen, 1830 is a family of acalipteran dipterans (Schizophora Becher, 1882; Muscomorpha Sharp, 1894) from small dimensions and by general coloring obscure distributed in all biogeographic regions (Figure 1)^[1-3].

1.1 Description

Most species are very small and dark in color, and their biological details have not yet been properly studied (Figures 2-6)^[4-6].

1.2 Biology, Ecology, Habitat and Distribution Geographic

Diptera are attracted feed to the body fluids of the prey

or predator and to them as commensals. It has been better to designate such behavior as kleptoparasitism if you know very little about the biology of most taxa that make up the Milichiidae; all groups are associated with decomposing plant and animal matter (saprophagy and coprophagy), including animal and human corpses, which is why those beans have potential importance in their forensic role; several species among them have very specialized ducts, predators are myrmecophiles or pollinators and a phoretic vector (Figure 7)^[7-12].

Kleptoparasitism or commensalism: It is a feeding form in which one animal deliberately takes food from another. This strategy is evolutionarily stable when theft is less costly than direct feeding, that can mean when

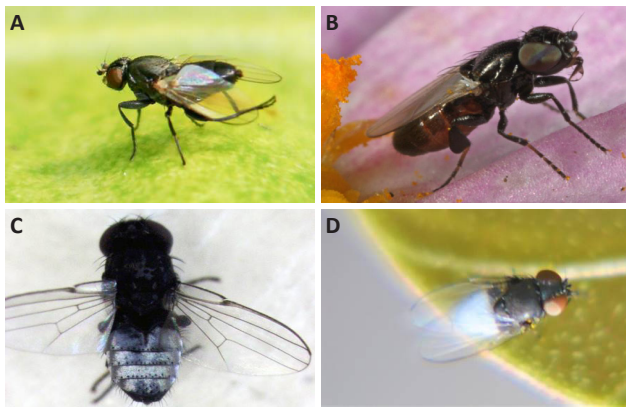


Figure 1. Specimens of Michilliidae family. A: *Desmometopa varipalpis* Malloch, 1927; B: Genus *Leptometopa*; C: Genus *Protophormia*; D: Genus *Milichiella*. Source: <https://www.biodiversity4all.org/taxa/329891-Milichiidae>

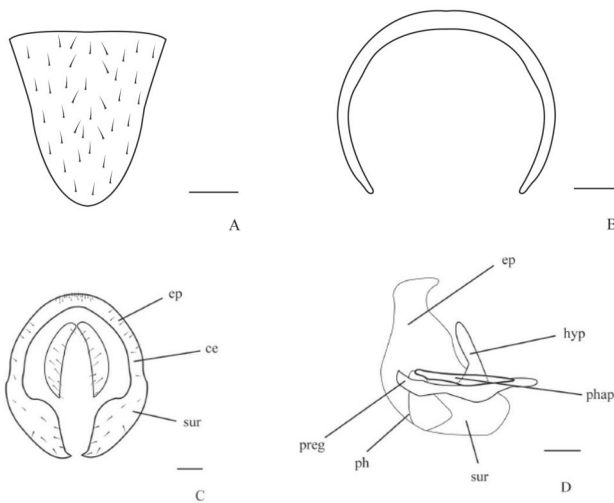


Figure 2. *Leptometopa veracildae* sp. nov. A: Male sternite 5, ventral view; B: Synsternite 7/8, posterior view; C: Male genitalia, posterior; D: Male genitalia, lateral view. Notes: ce: cerci; ep: epandrium; hyp: hypandrium; ph: phallus; phap: phallapodeme; preg: pregonite; sur: surstylus. Source: <https://www.scielo.br/j/paz/a/DjG43B9g9jZyD99cf3Q5LF/?lang=en#>

food is scarce or when it is plentiful.

Phoretic vector: It captures a fly of another species during flight and lays its eggs in the captured fly's abdomen. Captured flies are true vectors for their eggs and are also called phoretics. The main vectors are the horn fly, stable fly and housefly.

Definition of forensic flies: The most common are those called scavengers, because in their larval stage they feed on the tissues of the corpse until they reach the moment when they take shelter somewhere to complete their metamorphosis.

Forensic importance: Entomology is a broad and diverse field of research that includes arthropods that

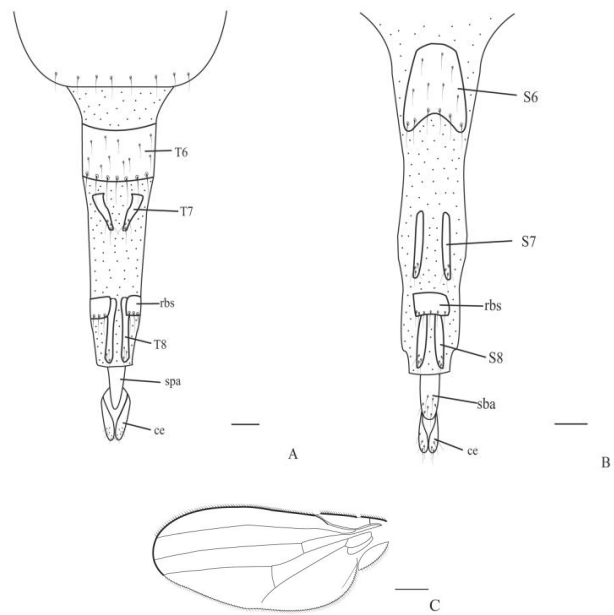


Figure 3. *Leptometopa veracildae* sp. nov. A: Female ovipositor, dorsal view; B: Female ovipositor, ventral; C: Wing. Notes: ce: cerci; rbs: ring of barbed spines; S: sternite; sba: surstylus; T: tergite. Source: <https://www.scielo.br/j/paz/a/DjG43B9g9jZyD99cf3Q5LF/?lang=en#>

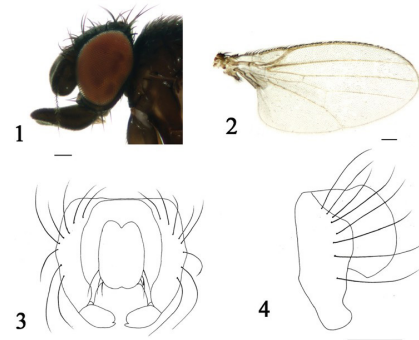


Figure 4. *Phyllomyza guangxiensis* sp. n. (male). 1: Head, lateral view; 2: Wing; 3: Epandrium, cerci, and surstyli, posterior view; 4: Epandrium, cerci, and surstyli, lateral view. Source: <https://zenodo.org/record/1278060#.Y1Df5XZBxPZ>

interact with various aspects of life and human activities and products derived from them, such as food, housing and construction, health and the environment. Among the divisions of Entomology, it is in Forensic Entomology that the interaction between arthropodology and the judicial system takes place.

It can be said that Forensic Entomology is the science that applies the study of insects and other arthropods to legal proceedings. It is divided into three main areas focused on topics that are frequently the subject of litigation (Figure 8).

The larvae of these insects feed primarily on decaying plant matter, decaying wood or bark/rind and may be reared from manure or decaying plant materials (Figures

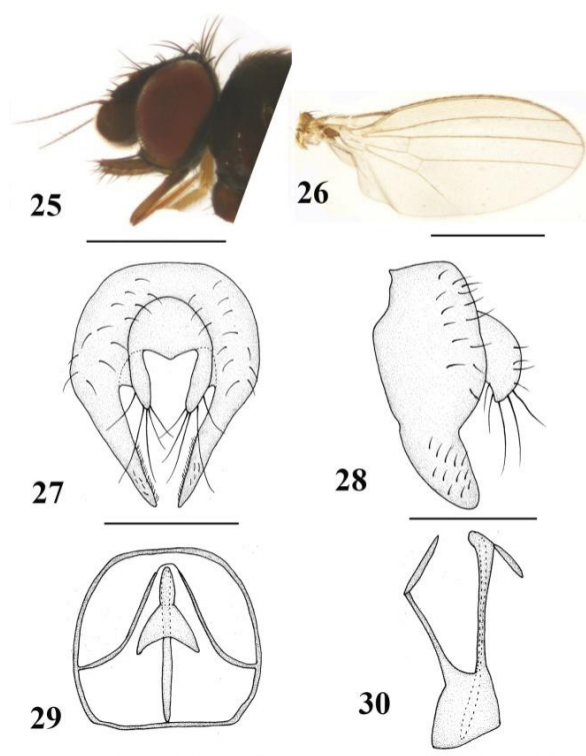


Figure 5. *Neophyllomyza lii* Xi & Yang, 2014 (male). 25: Head, lateral view; 26: Wing; 27: Epandrium, cerci, and surstyli, posterior view; 28: Epandrium, cerci, and surstyli, lateral view; 29: Genitalia, posterior view (hypandrium; phallapodemic; subepandrial); 30: Genitalia, lateral view (hypandrium; phallapodemic; subepandrial). Source: <https://zookeys.pensoft.net/article/36247/zoom/fig/15>

9-11)^[13-15].

The fly also feeds on other animals, but does not capture them, so it accompanies the bed bug in order to take advantage of the food it kills. The genus *Desmometopa* may be kleptoparasites of predatory insects such as *Redbots* (Heteroptera) and such some spiders such as *Homises* and *Nephiles* (Figure 12)^[15,17-19].

1.3 Taxonomy

The Michillidae family is composed of almost 250 species of small flies, distributed in 19 genera. Como for them classification schemes there are divergences among the expert's group (Figure 13)^[20,21].

1.3.1 Subfamily Madizinae

Aldrichiomyza Hendel, 1914, *Desmometopa* Loew, 1866, *Enigmilichia* Deeming, 1981 *Leptometopa* Becker, 1903, *Madiza* Fallén, 1810, *Paramyia* Williston, 1897 and *Stomosis* Melander, 1913 (Figure 14A)^[22,23].

1.3.2 Subfamily Milichiinae

Eusiphona Coquillett, 1897, *Milichia* Meigen, 1830, *Milichiella* Giglio-Tos, 1895, *Pholeomyia* Bilimek, 1867 and *Ulia* Becker, 1907 (Figure 14B).

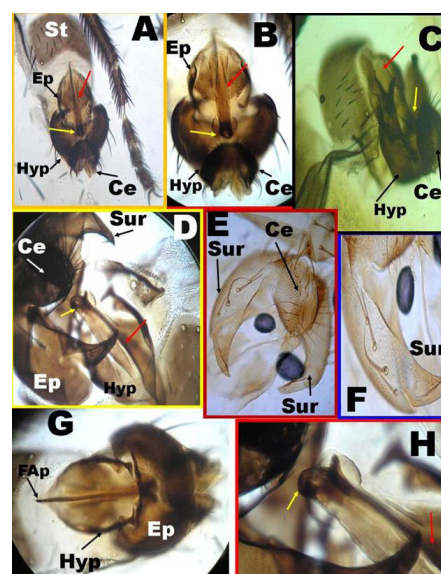


Figure 6. *Desmometopa leptometopoides* Sabrosky, 1983 (Diptera: Milichiidae), Male. External genitalia. A: Ventral view; B: Lateral view; C: Dorso-lateral view (5x); D: Hypandrial complex in ventral view (10x); E: Magnification of surstyle and cerci (10x), clarification: KOH 20%; F: Surstyle (South) magnification (40x), clarification: KOH 20%; G: Hypandrial complex in dorsal view; H: Magnification of basiphallus and distiphallus (40x). Yellow arrows show the basiphallus and red arrows the distiphallus. Notes: Ce: cerci; Ep: epandrium; Hyp: hypandrium; St: sternum; Sur: surstylus. Source: https://www.researchgate.net/figure/Figura-3-Desmometopa-leptometopoides-Macho-Genitalia-externa-Vista-ventral-A-vista_fig2_325722467

1.3.3 Subfamily Phyllomyzinae

Orneomyia Brake, 2004, *Costalima* Sabrosky, 1953, *Microsimus* Aldrich, 1926, *Neophyllomyza* Melander, 1913, *Paramyioides* Papp, 2001, *Phyllomyza* Fallén, 1810 and *Xenophyllomyza* Ozerov, 1992 (Figures 15 and 16)^[24-26].

1.4 Objective

The objective of this work is to investigate the bioecology, bionomy, biography and systematics of the Milichiidae family (Arthropoda: Insecta: Diptera).

2 METHODS

The method used to prepare this mini review was Marchiori, 2021 methodology^[27].

3 STUDIES CONDUCTED AND SELECTED

3.1 Study 1

3.1.1 Family Milichiidae

The Milichiidae are small, elongated, black or silver flies. The larvae live in decaying plant or animal material. Some are commensals or predators. Some species are ectoparasites of birds.

3.1.2 Subfamily Madizinae

Desmometopa (*Platophrymyia*) *tarsalis* Loew, 1866.



Figure 7. *Milichia patrizii* Hennig, 1952. 1: A *Crematogaster tricolor* Gerstaecker, 1859 (Hymenoptera: Formicidae) trail on an *Acacia* (Fabaceae); 2: A *Milichia* sp. into the middle of the *Crematogaster* Lund, 1831 trail to pursue an individual ant. This attempt was unsuccessful, as the ant was able to move past the fly without stopping; 3: An ant in a successful attack by grabbing the ant's antennal club between the paired basoflagellomeres of its own antennae; 4: An ant in a successful attack by grabbing the ant's antennal club between the paired basoflagellomeres of its own antennae. The ant crouches down while the fly initiates the gurgitation process by extending its proboscis into the mouthparts of the ant. 5: General view; 6: An enlargement showing details of the food exchange interaction. The ant's antenna is enfolded by the pilose clypeal membrane of the fly's proboscis. The long hairs on the fly's proboscis likely serve to capture liquids from the mouth of the ant; 7: The ant briefly sits motionless following the interaction; 8: *Trophallaxis* food-sharing behaviour between two *Crematogaster tricolor* Gerstaecker 1859 (Hymenoptera: Formicidae) nestmates. Sources: Wild & Brake, 2009 and <https://milichiidae.myspecies.info/category/classification/milichia-patrizii>

Desmometopa (Platophrymyia) tarsalis Loew, 1866.

Platophrymyia nigra Williston, 1896 [Desmometopa] (Figure 17).

Distribution: Asia, Hawaii, USA, Cuba, St. Vincent, Grenada, Barbados, Sta. Lucía, Dominica, Dominican, Montserrat, Virgenes, Puerto Rico, Bahamas, Jamaica, Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Tobago,

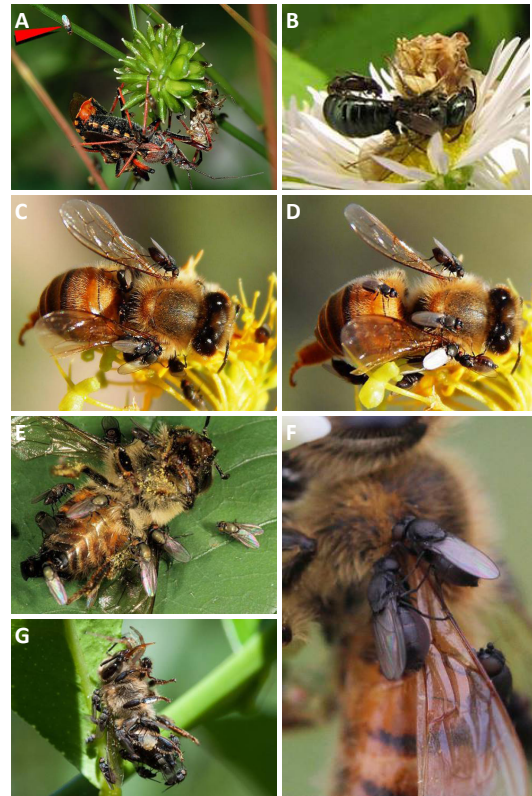


Figure 8. Milichiidae attending *Rhinocoris* bugs mating as the female feeds. A: *Neophyllomyza* sp. on bee killed by ambush bug; B: Freeloader flies (Milichiidae); C and D: Desmometopa; E, F and G: Milichiidae family. Sources: https://commons.wikimedia.org/wiki/File:Milichiidae_fg01.jpg; <https://www.biodiversity4all.org/taxa/329891-Milichiidae>; <https://bugguide.net/node/view/1145632> and Photo 16193462, (c) Wynand Uys; Photo 16193462, (c) Wynand Uys; Photo 15693329, (c) Magriet b.



Figure 9. Family Milichiidae feeding on organic animal material. Sources: <https://www.biodiversity4all.org/taxa/329891-Milichiidae>

Venezuela, Guyana and Ecuador.

Biology: Saprophagous.

3.1.3 Subfamily Milichiinae

Milichiella lacteipennis (Loew, 1866) (Figure 18).

Distribution: Dominica, Cuba, Hispaniola, Jamaica, Puerto Rico, St. Vincent, Is. Virgins, St. Thomas, Mexico, Nicaragua (Managua), Costa Rica, Panama,



Figure 10. A crab spider (top left) that has killed a bullet ant queen and at least 2 species of small flies (Milichiidae & Phoridae) have arrived to feed from the carcass and/or lay their eggs. Source: <https://www.antwiki.org/wiki/Spiders>



Figure 12. Genus *Nephila* (spider). Source: <https://en.wikipedia.org/wiki/Nephila>

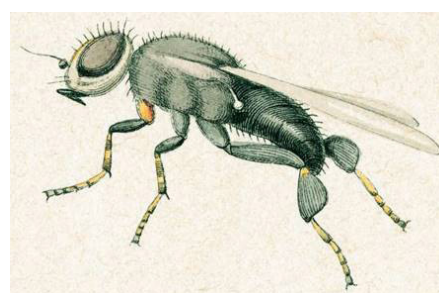


Figure 13. *Leptometopa latipes* (Meigen, 1830). Source: https://www.diptera-info.nl/infusions/checklist/view_family.php?fam_id=158

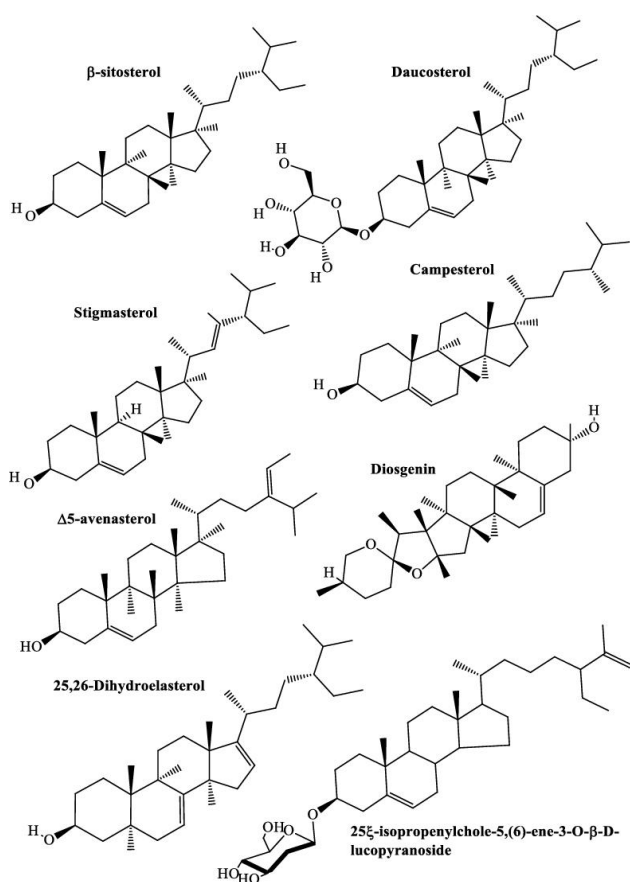


Figure 11. Chemical structures of phytosterols identified in *Momordica charantia* L. (Cucurbitaceae) fruit and leaves. Numerous compounds that have been identified in the extracts of *M. charantia*, including phytosterols, terpenoids, fatty acids, phenolic compounds, phenolic acids and flavonoids. the biological effects of *M. charantia* extracts, including their antidiabetic, neuroprotective, anti-obesogenic, antimalarial, antioxidant, anti-inflammatory, antimicrobial and allelopathic activities. Source: <https://www.semanticscholar.org/paper/Phytochemical-profile-and-biological-activities-of-Oliveira-Costa/c1f01cd9b99ad8bcb55149843ba94a28e259e0ce>



Figure 14. Subfamily Madizinae. Sources: <https://bugguide.net/node/view/1210747> and <https://en.wikipedia.org/wiki/Milichiidae>



Figure 15. Subfamily Phyllomyzinae. Source: http://v3.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxid=589086

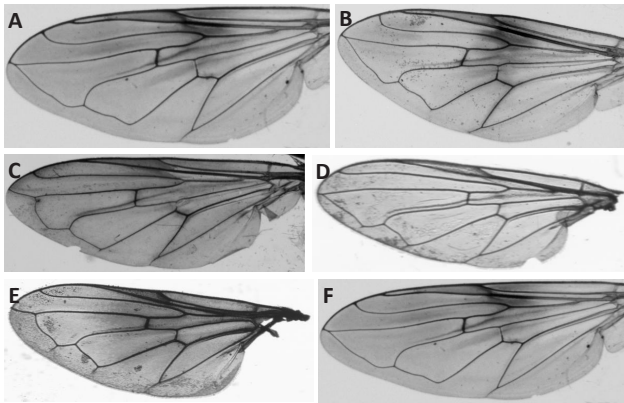


Figure 16. Wings. A: *Myolepta nigratarsis* Coe 1957, wing; B: *Myolepta dubia* (Fabricius, 1805), wing; C: *Hammerschmidtia ferruginea* (Fallén, 1817), wing; D: *Brachyopa pilosa* Collin, 1939, wing; E: *Melanogaster nuda* (Macquart, 1829), wing; F: Dipteran phylogeny. Source: <http://drawwing.org/insects/diptera/milichiidae>

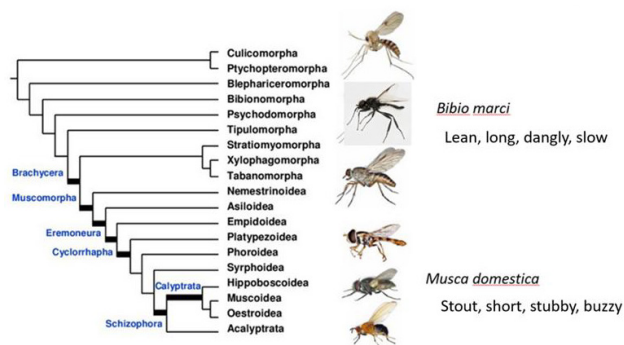


Figure 17. *Desmometopa*. Source: <https://species.wikimedia.org/wiki/Desmometopa>

Venezuela, Peru and Brazil.

Collected on: Poaceae: *Zea*.

3.1.4 Subfamily Phyllomyzinae

Pholeomyia longiseta (Becker, 1907).

Milichia longiseta Becker, 1907 [*Paramilichia* and *Rhynchomilichia*] (Figure 19).

Distribution: Nicaragua, Paraguay and Argentina.

3.1.5 General Summary

- 1-Body symmetry: Bilaterally symmetrical.
- 2-Is eaten by *Ictinogomphus rapax* (Rambur 1842).
- 3-Diurnal behavioral circadian rhythm; holometabolous mode of development; eats *Apis mellifera* Linnaeus 1758.
- 4-First appearance 70.599999999999 million years ago.
- 5-Habitat: Field.
- 6-Number of fossil occurrences: 13.
- 7-Visits flowers of *Lavandula stoechas* L. (Lamiaceae).
- 8-Visual system ocelli wing^[28-32].



Figure 18. *Milichiella lacteipennis* (Loew, 1866). Source: <https://milichiidae.myspecies.info/category/classification/milichiella-lacteipennis>



Figure 19. *Milichia longiseta* Becker, 1907. Source: <https://milichiidae.myspecies.info/category/classification/milichiella-longiseta>

3.2 Study 2

The aim of this study was to report the first record of *Desmometopa leptometopoides* Sabrosky, 1983 (Diptera: Milichiidae) for the Neotropical region and *Desmometopa varipalpis* Malloch, 1927 for Venezuela (Figure 20).

The aim of this study was to report the first record of *D. leptometopoides* for the Neotropical region and *D. varipalpis* for Venezuela.

Between May and July 2017, 10 daytime catches (N1=45, N2=210, N3=11, N4=55, N5=43, N6=25, N7=68, N8=54, N9=23, N10=91) with glass suction cups, small adult flies. The insects were transported to the Laboratory of Entomology, Parasitology and Tropical Medicine National Experimental University Francisco de Miranda (Figure 21).

Analysis of external and internal morphology of imagos, especially of 311 copies males, using taxonomic keys allowed the identification of the species *D. leptometopoides*.



Figure 20. *Desmometopa leptometopoides* Sabrosky, 1983 (Diptera: Milichiidae). Source: <https://milichiidae.myspecies.info/category/classification/desmometopa-leptometopoides>



Figure 21. *Desmometopa varipalpis* Malloch, 1927 for Venezuela. Source: <https://bugguide.net/node/view/675592>

(N=309♂; 5♀) and *D. varipalpis* (N=2♂).

Desmometopa leptometopoides has been reported on the African continent (Nigeria, South Africa, Liberia, Cameroon, Ghana and Tunisia) maintained from mud and debris from swimming pools, and in the Nearctic Region (Florida, the United State) obtained and bred to from the fruits of *Momordica charantia* L. (Cucurbitaceae) (Figure 22).

Therefore, this appears as the first report of this species of Milichiidae for the Neotropical region and particularly for the country. In contrast, *D. varipalpis* has a wide distribution that covers practically all the zoogeographic zones.

In light of what has been discussed, detailed studies are needed to quantify the role of *Desmometopa* taxa as quality indicators in the dynamics of composting in the bioecological conditions given in Venezuela, especially in cities where urban agriculture can represent a viable alternative for many families.

It is important to highlight the findings of some



Figure 22. *Momordica charantia* L. fruit and leaves (Cucurbitaceae). Source: <https://academicjournals.org/journal/AJB/article-abstract/14B9F2057674>

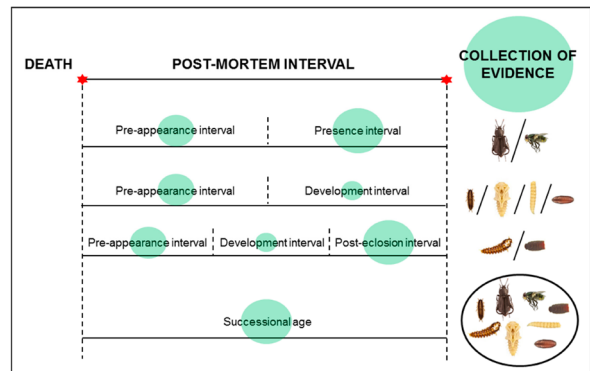


Figure 23. Sources of inaccuracy in the estimation of the post-mortem interval based on insect evidence. Green circles represent the sources, their size represents importance of the sources. Sources: <https://www.mdpi.com/2075-4450/12/4/314>

species of *Desmometopa* (e.g. *Desmometopa varipalpis*) and others unidentified as part of the cadaverous fauna, both in humans and animals, so that they are considered as again that possess a potential to be used in legal medicine investigations, being able to be used for the estimation of the Intervals Post Mortem (Forensic Entomology) (Figure 23).

The international trade of tropical fruits appears as the probable mechanism of expansion of the populations of *D. leptomatotopoides* and *D. varipalpis*, which seem to have adapted successfully in the Falconian urban semi-arid^[33,34].

3.3 Study 3

Desmometopa varipalpis Malloch, 1927, an interesting species of Diptera common in urban areas. Species of this family are common in cities where they breed in culverts. They are also common in manure compost. Their appearance in large numbers in the bases of buildings is usually an indication that there is a blockage or leak in the sewage network (Figure 24).

In truth, in some areas it is more common and it can

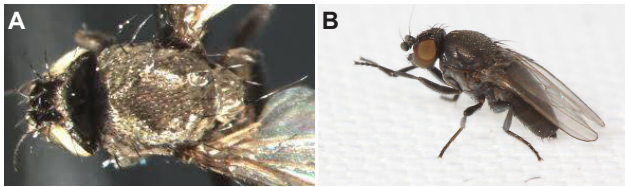


Figure 24A. *Desmometopa sordida* (Fallén, 1820). **Figure 24B.** *Desmometopa varipalpis* Malloch. A: 1-Foreleg exerted by the species *a sordida* Fallén; B: 2-Foreleg exerted by the species *D. varipalpis*. Sources: <https://milichiidae.myspecies.info/category/classification/desmometopa-sordida> and <https://bugguide.net/node/view/675592>



Figure 25. Detail of the adhesive sheet. Source: C. Pradera 08-2021



Figure 26. Wing of *Desmometopa varipalpis* Malloch, 1927. Source: C. Pradera 08-2021.

become a more captured species using an adhesive sheet of. This is a nice device from Sani trade in which *Desmometopa varipalpis* is or more abundant (Figure 25).

Description: 1-Wing venation with very visible hairs. 2-Head appears clearly between the eyes, black on a gray background. 3-Hind legs whose tarsomeres are light and also the gena are light (Figure 26).

Its presence in urban areas is due to the fact that the larva is coprophagous and carnivorous. Therefore, it can be found in wastewater and manure. It also appears to be saprophagous and can be found in other decaying plants. In fact, the device for capturing insects was located near a company dedicated to processing grain (Figure 27A and B).



Figure 27. *Desmometopa varipalpis* Malloch, 1927. A and B: Head of *D. varipalpis*; C: Back tarsi of *D. varipalpis*. Source: C. Pradera 08-2021

In adults of the *Desmometopa* genus, a common relationship with predators such as spiders has been observed. The spiders are slow at the time of ingesting their prey and they first have to detach their victims from the inside and suck them. These are used by flies to suck fluids from the prey that the spiders have captured. Adults measure between 2-3mm. The larva develops in 2-3 weeks (Figure 27C)^[35].

3.4 Study 4

3.4.1 Genera and Species of Milichiidae in Venezuela.

In Venezuela, knowledge about the Milichiidae family is very limited, as far as it has been possible to investigate, only three genera have been reported *Pholeomyia* Bilimek, 1867, *Milichiella* Giglio-Tos, 1895,



Figure 28. *Pholeomyia hurdi* Sabrosky, 1959. Source: Hurd PD Collector.

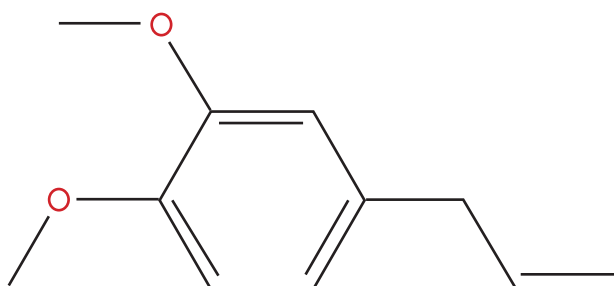


Figure 29. 1,2-Dimethoxy-4-(2-propenyl)-benzene
Formula: $C_{11}H_{14}O_2$. Semiochemical, Floral Compound um two components to attract floral agents. Source: <https://www.pherobase.com/database/compound/compounds-index.php>

Desmometopa Loew, 1866 and six species, including *Pholeomyia hurdi* Sabrosky, 1959, *Pholeomyia myopa* Melander, 1913, *Pholeomyia politifacies* Sabrosky, 1959, *Milichiella lacteipennis* Loew, 1866 and *Desmometopa tarsalis* Loew, 1866 (Figures 28-30)^[36].

3.5 Study 5

The genus *Eusiphona* Coquillett, 1897, of the Milichiidae family, is characterized by its long and thin proboscis that, in addition, appears to be geniculate, it was known only from the Nearctic region. A key to aid your recognition, with notes on the bionomy of *Eusiphona cooperi* Sabrosky 1955 was published by Sabrosky in 1955 (Figure 31).

After the publication of the catalog, two specimens of an unidentified species of *Eusiphona* from Brazil, were collected in 1929 and 1937 and two others hunted in Costa Rica. These findings predate the introduction in Latin America, from the United State, of *Megachile rotundata* (Fabricius, 1793) (Hymenoptera: Megachilidae); in addition, the Brazilian specimens apparently correspond to the new species, which reinforces the opinion that we are in the presence of a Neotropical form. (Source: Sabrosky CW. A new species of *Eusiphona* from the Argentine



Figure 30. *Milichiella lacteipennis* Loew, 1866. Source: Photo taken by I. Brake.



Figure 31. Genus *Eusiphona* Coquillett, 1897, of the Milichiidae family. Sources: Photo: P. Brake and <https://bugguide.net/node/view/375129/bgpage>

Republic. (Diptera, Milichiidae). *Rev Museo La Plata*, 1982; 13: 1-128) (Figure 32)^[37].

3.6 Study 6

In the late 1970s and early 1980s, the behavior of a species of Megachilidae, commonly called “cutting bees”, was investigated in the Canada de Gomez area, Santa Fe province, Argentina.

During observations in those years, it was found that many of the megachilid nests that were studied were parasitized with pupae that responded to the characteristics of some dipterans. They were found inside these nests. Once this cell is made, the bee carries pollen with its scopa which collects from different species of flowers, up to about half of the cell. He then lays an egg and closes the cell with circular cutouts (Figure 33).

In the first place, it was observed that these dipteran pupae, as mentioned above, were inside these cells, more precisely between the cuts that constitute them, leaving the interior empty, with remains of excrement and without the pollen and eggs that had been deposited by the bee. Then, in subsequent observations, the larvae were found inside the cells feeding on the pollen. There



Figure 32. *Megachile rotundata* (Fabricius, 1793) (Hymenoptera: Megachilidae). Source: Pest and Diseases Image Library.



Figure 33. Megachilidae family (Hymenoptera: Apoidea). Source: <https://genent.cals.ncsu.edu/insect-identification/order-hymenoptera/family-megachilidae>

was no doubt that these pupae came from larvae that fed on pollen, leaving no food for the megachilid larva and, even more, unable to hatch the egg.

The type of interspecific relationship between the dipteran and the megachilid was thus determined: that of parasitism. Later, adult females could also be observed floating around megachilid nests to lay eggs. Possibly, egg laying occurred when the Megachilidae left the cell with pollen without completing it, for the next day, as night had already arrived. These bees do not stay in the nest at night or on rainy days or other inclement weather. Therefore, the nests are exposed to these dipterans and other natural enemies (Figure 34).

In the first place, it was observed that these dipteran pupae, as mentioned above, were inside these cells, more precisely between the cuts that constitute them, leaving the interior empty, with remains of excrement and without the pollen and eggs that had been deposited by the bee. Then, in subsequent observations, the larvae were found inside the cells feeding on the pollen. There was no doubt that these pupae came from larvae that fed on pollen, leaving no food for the megachilid larva and, even more, unable to hatch the egg^[38].

The type of interspecific relationship between the

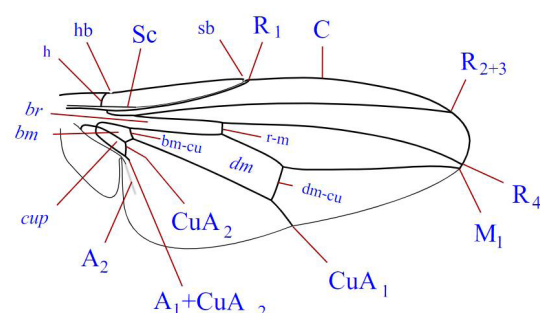


Figure 34. Costal breaks. hb: Humeral break; sb: Subcostal break. Longitudinal veins: C: Coast; Sc: Subcosta; R: Radius; M: Medium; Cu: Cubitus; A: Anal. Crossveins: h: Humeral; r-m: Radial-medial; bm-cu: Medial-ulnar basal; dm-cu: Medial-ulnar disc. Cells: br: 1st basal; bm: 2nd basal; dm: disc; cup: cell cup. Source: https://commons.wikimedia.org/wiki/File:Eusiphona_wing_veins.svg



Figure 35. Pupae of genus *Eusiphona*. Source: <https://milichiidae.myspecies.info/taxonomy/term/403/media>

dipteran and the megachilid was thus determined: that of parasitism. Later, adult females could also be observed floating around megachilid nests to lay eggs. Possibly, egg laying occurred when the Megachilidae left the cell with pollen without completing it, for the next day, as night had already arrived. These bees do not stay in the nest at night or on rainy days or other inclement weather. Therefore, the nests are exposed to these dipterans and other natural enemies (Figure 35).

A systematic observation revealed a Diptera of the Milichiidae family, of the genus *Eusiphona* and of the cooperative species, first described by Sabrosky in 1955. Morphological characteristics for these species. Therefore, it turned out to be a new species of the genus *Eusiphona* which he called species *Eusiphona vittata*, Sabrosky 1982^[38].

4 CONCLUSION

Most Milichiidae species are very small and dark in color and the details of their biology have not yet been properly studied. It is known that the Milichiidae are associated with decomposing plant and animal matter (saprophagy and coprophagy), including animal and human corpses, which is why it has potential importance in its forensic importance; several species have very specialized ducts, predators are myrmecophiles or

pollinators and a phoretic vector.

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Conflicts of Interest

The author declared no conflict of interest.

Author Contribution

Marchiori CH contributed to the manuscript and approved the final version.

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