

# Flower flies of southeastern Brazil (Diptera: Syrphidae)

## Part I. Introduction and new species

[Schwebfliegen aus dem Südosten von Brasilien (Diptera: Syrphidae)  
Teil I. Einleitung und Beschreibung neuer Arten]

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### Abstract

A review is given to the flower fly fauna of southeastern Brazil. Eight new species are described and their critical characters are illustrated: *Aristosyrphus* (s. str.) *minutus* THOMPSON, spec. nov., [Brazil (Rio & Paraná)]; *Microdon* (s.str.) *mourei* THOMPSON, spec. nov. [Brazil (Paraná & Santa Catarina)]; *Microdon* (s.str.) *aureopilis* MARINONI, spec. nov. [Brazil (Paraná & Santa Catarina)]; *Microdon* (*Pseudomicrodon*) *pilosops* MARINONI, spec. nov. [Brazil (Paraná & Santa Catarina)]; *Microdon* (*Pseudomicrodon*) *chrysostypus* THOMPSON, spec. nov. [Brazil (Santa Catarina)]; *Mixogaster imitator* THOMPSON, spec. nov. [Brazil (Paraná & Santa Catarina)]; *Copestylum profaupar* MARINONI, spec. nov. [Brazil (Paraná & Santa Catarina)] and *Myolepta* (*Protepidostola*) *marinonii* MARINONI, spec. nov. [Brazil (Paraná)].

### Key words

Syrphidae, flower flies, Neotropics, Brazil, new species, *Aristosyrphus*, *Microdon*, *Mixogaster*, *Copestylum*, *Myolepta*

### Zusammenfassung

Es wird ein Überblick der Schwebfliegenfauna südost-Brasiliens gegeben. Acht neue Arten werden beschrieben und die bestimmungsrelevanten Merkmale der Männchen abgebildet: *Aristosyrphus minutus* THOMPSON spec. nov. [Brasilien (Rio & Paraná)]; *Microdon* (s.str.) *mourei* THOMPSON spec. nov. [Brasilien (Paraná & Santa Catarina)]; *Microdon* (s.str.) *aureopilis* MARINONI spec. nov. [Brasilien (Paraná & Santa Catarina)]; *Microdon* (*Pseudomicrodon*) *pilosops* MARINONI spec. nov. [Brasilien (Paraná & Santa Catarina)]; *Microdon* (*Pseudomicrodon*) *chrysostypus* THOMPSON spec. nov. [Brasilien (Santa Catarina)]; *Mixogaster imitator* THOMPSON spec. nov. [Brasilien (Paraná & Santa Catarina)]; *Copestylum profaupar* MARINONI spec. nov. [Brasilien (Paraná & Santa Catarina)] und *Myolepta* (*Protepidostola*) *marinonii* MARINONI spec. nov. [Brasilien (Paraná)].

### Stichwörter

Syrphidae, Schwebfliegen, Neotropis, Brasilien, neue Arten, *Aristosyrphus*, *Microdon*, *Mixogaster*, *Copestylum*, *Myolepta*

## Introduction

Brazil is one of the megadiverse countries in the world and was the site where the nations of the world formally recognized the importance of biological diversity for mankind. In recognizing the significance of biodiversity, the Convention on Biological Diversity (1994) challenges nations, like Brazil, to first inventory their biological wealth. As little has been done to assess the biodiversity of flies, especially flower flies, an important component of all terrestrial ecosystems, we take this opportunity to report the preliminary results of biodiversity inventory for Paraná. These results will then serve as a benchmark for our future work.

Paraná is a state in the southeastern corner of Brazil along with Santa Catarina and Rio Grande do Sul. These three states are our focus. The Department of Zoology of the Federal University of Paraná developed a project, "Projeto de Levantamento da Fauna Entomológica do Paraná" [= PROFAUPAR], whose main goal was to survey the insect fauna. Eight localities were selected as representative sites: Antonina (litoral), São José dos Pinhais (Atlantic forest), Co-

lombo (first plateau), Jundiá do Sul, Ponta Grossa and Telêmaco Borba (second plateau) and Fênix and Guarapuava (third plateau) (MARINONI & DUTRA 1993). At each site, a Malaise and a light trap were run for two years (1986–1988). In the first year, from August 1986 to July 1987, material was collected weekly from the Malaise trap, resulting in 411 lots of a total of 832,542 insect specimens. The majority were flies (649,753 specimens), from which 1,617 syrphids were sorted. Among this material 111 species were sorted out. Names were found for 85, including the 8 new species herein described, but 26 others (indicated below as “morpho species”) could not be matched with named concepts and are of poorly known groups where new species descriptions would only add to existing confusion.

Very little faunistic work has been done on Neotropical flower flies or even Diptera. The only modern treatment is that of the West Indies, where THOMPSON (1981) provided a list of species, a key to them and a summary of the prior work, with illustrations of the critical taxonomic characters. The only other comprehensive faunistic treatments were those of Chile and southern Patagonia (SHANNON & AUBERTIN 1933) and Mexico and Central America (WILLISTON 1891–92). ETCHEVERRY (1963) provided only documentation of the past work on the Chilean fauna, but no keys nor new information. Beyond these works, there have only been catalogs (WILLISTON 1886, 1887 (South America); ALDRICH 1905 (North America); KERTÉSZ 1910 (World); STUARDO ORTIZ 1946 (Chile); BRÉTHES 1907 (La Plata); THOMPSON et al. 1976 (America s. USA)) and lists, many of which are incomplete and merely lists of single expeditions or collections (WILLISTON 1888 (Brazil); BRÉTHES 1904 (Argentina, Tucumán); SACK 1921 (Paraguay), 1941 (Peru); CURRAN 1934 (Guyana, Kartabo); VIMMER & SOUKUP 1938 (Peru); MARTONELL 1939 (Venezuela, Aragua); SOUKUP 1945, 1959 (Peru); d’ANDRETTA & CARRERA 1952 (Brazil, Acre); CAMPOS 1960 (Ecuador); LANE 1962 (Patagonia); DOESBURG 1962, 1966 (Suriname); ARNAUD 1963 (Mexico, Guadalupe I.); LINSLEY & USINGER 1966, Linsley 1977 (Galapagos); RAMIREZ GARCÍA 1997 (Mexico, Los Tuxtlas); ROBINSON 1984 (Falkland Is.); SEDMAN 1975 (Belize); ETCHEVERRY 1952 (Chile, Tarapaca). Other historical treatments were: GIGLIO-TOS (1892–1893) who revised the fauna of Mexico; LYNCH ARRIBÁLZAGA (1891–1892), Argentina; and PHILIPPI (1865), Chile. What is known of the Neotropical flower-fly fauna is largely buried in the taxonomic literature. This literature is summarized in the Neotropical Diptera catalog (THOMPSON et al. 1976) and in the key to Neotropical flower-fly genera (THOMPSON 1999).

The number of species of Syrphidae that occur in southeastern Brazil is unknown. We, however, estimate that for all of Brazil, the count of recorded and described flower flies is 2,030, of which 1,500 probably occur in southeastern Brazil. This estimate is based on the Neotropical Diptera catalog (THOMPSON et al. 1976) and the material in our respective collections (DZUP, USNM). While no list has ever been made, probably the largest number of species (more than 1,500) ever to have been described from a single locality was described from Nova Teutônia in the state of Santa Catarina. This is due to the work of a single man, Fritz PLAU-MANN, who was an outstanding collector for some 50 years (NOMURA 1991, 1995; PIEROZAN 1995; also see SPESSATO 2001). To date, 123 new flower flies have been described from Nova Teutônia, including 5 in this paper.

### **Preliminary list of species collected**

This list follows the arrangement used in the Neotropical catalog (THOMPSON et al. 1976). The original citation and other information about these names can be found in that catalog and is not included in this paper.

**SYRPHINAE****Syrphini**

- Allograpta exotica* (WIEDEMANN, 1830)  
*neotropica* CURRAN, 1936  
*similis* CURRAN, 1925
- Ocyptanotus anthiphates* (WALKER, 1849)  
*bonariensis* (BRÉTHES, 1905)  
*erebus* (HULL, 1943)  
*flukiella* (CURRAN, 1941)  
*funebri* MACQUART, 1834  
*gastrostactus* (WIEDEMANN, 1830)  
*lividus* (SCHINER, 1868)  
*luctuosus* (BIGOT, 1883)  
*panamensis* (CURRAN, 1930)  
*phaeopterus* (SCHINER, 1868)  
*sativus* (CURRAN, 1941)  
*tiarella* (HULL, 1944)  
*wulpianus* (LYNCH ARRIBÁLZAGA, 1891)  
 & 13 morpho spp.
- Pseudodoros clavatus* (FABRICIUS, 1794)  
*Salpiugogaster gracilis* SACK, 1920  
*Syrphus phaeostigma* WIEDEMANN, 1830

**Bacchini**

- Argentino-myia fastigata* (FLUKE, 1945)  
*lanei* (FLUKE, 1936)  
*longicornis* (WALKER, 1837)  
*pollinosa* (HULL, 1942)
- Leucopodella balboa* (HULL, 1947)  
*bigoti* (AUSTEN, 1893)  
*gracilis* (WILLISTON, 1891)
- Xanthandrus bucephalus* (WIEDEMANN, 1830)

**Toxomerini**

- Toxomerus aquilinus* SACK, 1941  
*confusus* (SCHINER, 1868)  
*procrasinatus* METZ, 2001  
*tibicen* (WIEDEMANN, 1830)  
 & 5 morpho spp.

**MICRODONTINAE**

- Aristosyrphus minutus* THOMPSON, spec. nov.  
*primus* CURRAN, 1941
- Microdon* (*Chymophila*) *aurifex* WIEDEMANN, 1830  
 (*Microdon*) *aureopilosis* MARINONI, spec. nov.  
 (*M.*) *histrion* WIEDEMANN, 1830  
 (*M.*) *mitis* CURRAN, 1940  
 (*M.*) *mourei* THOMPSON, spec. nov.  
 (*M.*) *nero* CURRAN, 1936  
 (*M.*) *triginus* CURRAN, 1940

- (*M.*) *virgo* CURRAN, 1940  
 (*Pseudomicrodon*) *chrysostrypus* THOMPSON, spec. nov.  
 (*P.*) *pilosops* MARINONI, spec. nov.  
 (*Rhoga*) *sepulchrasilvus* (HULL, 1937)

- Mixogaster flukei* HULL, 1954  
*imitator* THOMPSON, spec. nov.  
*sartocryptus* HULL, 1954
- Paramicrodon flukei* (CURRAN, 1936)

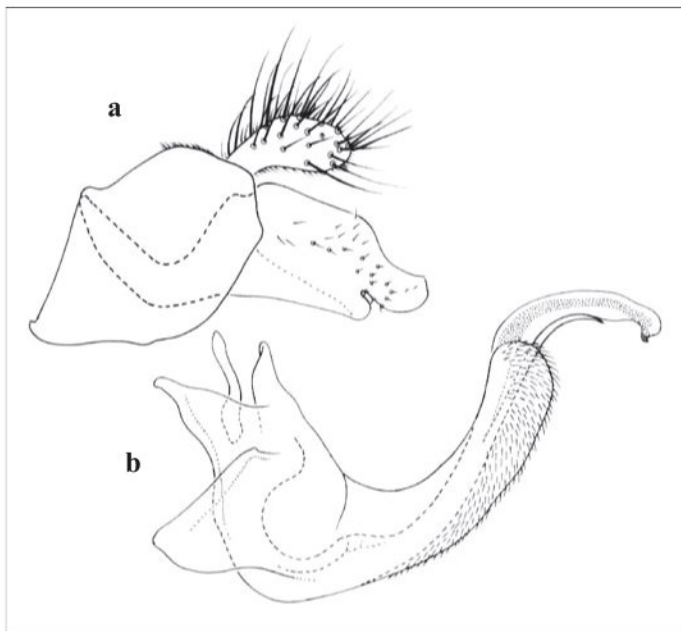
**ERISTALINAE**

- Rhingia nigra* MACQUART, 184
- Ornidia major* CURRAN, 1930  
*obesa* (FABRICIUS, 1775)
- Copestylum albifrons* (CURRAN, 1939)  
*belinda* (HULL, 1949)  
*chalybescens* (WIEDEMANN, 1830)  
*circe* (CURRAN, 1939)  
*circumdatum* (WALKER, 1857)  
*flukei* (CURRAN, 1936)  
*impressum* (HULL, 1949)  
*lanei* (CURRAN, 1936)  
*liriope* (HULL, 1949)  
*macquarti* (CURRAN, 1926)  
*meretricias* (WILLISTON, 1888)  
*obscurior* (CURRAN, 1939)  
*pica* (SCHINER, 1868)  
*procteri* (CURRAN, 1939)  
*profaupar* THOMPSON, spec. nov.  
*selectum* (CURRAN, 1939)  
*spinihorax* (LYNCH ARRIBÁLZAGA, 1892)  
*tripunctatum* (HULL, 1949)  
*trituberculatum* (THOMPSON, 1976)  
*vagum* (WIEDEMANN, 1830)  
 & 5 morpho spp.
- Lepidomyia vulturella* (HULL, 1946)
- Myolepta marinonii* MARINONI, spec. nov.  
*scintillans* (HULL, 1946)
- Polybiomyia wulpji* (WILLISTON, 1888)
- Habromyia chrysotaenia* (FLUKE, 1937)
- Quichuana* – 1 morpho spec.
- Meromacrus basiger* (WALKER, 1860)  
*nectarinoides* (LYNCH ARRIBÁLZAGA, 1892)  
*niger* SACK, 1920
- Palpada furcata* (WIEDEMANN, 1819)  
*precipua* (WILLISTON, 1888)  
*scutellaris* (FABRICIUS, 1805)  
*triangularis* (GIGLIO-TOS, 1892)  
*urotaenia* (CURRAN, 1930)
- Neplas* – 4 morpho spp.

**Description of new species*****Aristosyrphus* (*Aristosyrphus*) *minutus* THOMPSON, spec. nov.**

(Fig. 1a–b)

**Male. Head:** Face brownish except slightly yellow laterally, shiny except narrowly white pollinose laterally, white pilose; gena brown, yellow pilose; frontal lunule black; frons and vertex brown, shiny, yellow pilose; ocellar triangle black; occiput brown, sparsely grayish pollinose, yellow pilose; antenna brown, black pilose, ratio 5:1:13; arista long, about 3/4 as long as basoflagellomere.



**Thorax:** Postpronotum yellow; scutum brown, brownish yellow pilose; scutellum brown, white pilose; pleuron brown except yellow along posterior margin of anepisternum and dorsal katepisternum, black pilose; calypter brown; halter white. **Wing:** very light brownish, microtrichose except bare basal 1/4 of cell R and basoposterior 1/3 of cell BM.

**Fig. 1a–b:** Male genitalia of *Aristosyrphus minutus* THOMPSON, spec. nov. – **a:** Lateral view of 9th tergum and associated structures; – **b:** Lateral view of 9th sternum and associated structures.

**Legs:** coxae, trochanters brown, black pilose; pro and mesofemora brown on basal 1/2, yellow apically, black pilose with some yellow pile intermixed apically; metafemur brown except yellow apex, black pilose; pro and mesotibiae yellow except brownish apical 1/3, yellow pilose basally, black pilose apically; metatibia yellow on basal 1/3, brown apically, yellow pilose except with black pile intermixed on apical 2/3; tarsi orange, black pilose.

**Abdomen:** 1st tergum brown, yellow pilose; 2nd tergum brown except apical margin narrowly yellow, black pilose except yellow pilose laterally; 3rd tergum brown except apical 1/4 orange, black pilose except yellow pilose apically and laterally; 4th tergum brown, black pilose except yellow pilose on apical 1/4; 1st sternum brown; 2nd sternum brown except yellow apical 1/4; 3rd and 4th sterna brown, black pilose except yellow pilose apically; genitalia brown, yellow and black pilose.

**Female.** Similar to male except for normal sexual dimorphism\* and: 5th tergum brown, black pilose; cercus orange.

**Length.** 6.4 mm, wing, 4.7 mm.

**Types. Holotype:** BRAZIL. Paraná, Antonina, Reserva Sapitanduva, 23 February 1987, Malaise trap (pinned from alcohol), Lev. Ent. PROFAUPAR, ♂, deposited in Collection of Departamento de Zoologia da Universidade Federal do Paraná, Curitiba (DZUP). **Paratypes:** same locality and date as holotype (1 ♂ DZUP), ... 3 November 1986 (1 ♂ DZUP), ... 10 November 1986 (1 ♀ USNM); Brazil, Distrito Federal [= Rio de Janeiro], Pico da Tijuca, 8 December 1940, R. C. SHANNON (1 ♀ USNM); Paraná: Colombo, EMBRAPA Br 476, km 20, 12 January 1987, Lev. Ent. PROFAUPAR (1 ♀ DZUP); Ponta Grossa (Vila Velha), Reserva IAPAR, Br 376, 5, 9, 12, 19 January 1987, Lev. Ent. PROFAUPAR (4 ♀ ♀ DZUP), ... 22 December 1986, Lev. Ent. PROFAUPAR (1 ♂ DZUP).

**Remarks.** Among the species of *Aristosyrphus*, *minutus* is readily distinguished by its very small size; all other species are more than 10 mm in length. Hence, the specific epithet, *minutus*, which is an adjective.

\* The expression “except for normal sexual dimorphism” is regularly used to avoid wasting space on the obvious, such as noting that the female sex has an ovipositor and related structures, not aedeagus, surstyle, etc. And in most syrphids, dichoptic eyes, not holoptic.

***Microdon (Microdon) aureopilis* MARINONI, spec. nov.**

(Fig. 2a–c)

*Microdon* 74-12

**Adult (male & female). Head:** Metallic green; face shiny except very narrowly white pollinose laterally, yellowish white pilose; frontal lunule brownish; frons shiny except very narrowly white pollinose laterally, yellowish white pilose except black pilose medially; vertex shiny, yellow pilose except black pilose across ocellar triangle; ocellar triangle equilateral, small, well-isolated from eye margin; antenna brownish black, black pilose; antennal ratio 3:1:2; arista about 3/4 as long as basoflagellomere; eye very sparsely and short pilose, with pili about as long as ommatidial diameter; occiput sparsely white pollinose, white pilose ventrally becoming golden dorsally, with a few black pili intermixed on dorsal 1/3.

**Thorax:** Metallic green except for a large medial quadrate purple macula (this macula is clearly only for some views), shiny, long golden pilose; proepimeron bare; katepisternum without anteroventral pile patch; scutellum with apicolateral calcar; calypter white with orange margin; halter orange. **Wing:** hyaline, almost completely microtrichose; bare cell R except along spurious vein, posterobasal 1/2 of cell BM, anterobasal 1/5 of cell CuP and medially on alula. **Legs:** brownish black except metacoxa metallic green, yellowish white pilose.

**Abdomen:** Oval, 2nd segment about half as long as 3rd and 1/4 as long as 4th; sterna bluish green, shiny, long white pilose; 1st sternum well-developed; 1st & 2nd terga metallic green, shiny, golden pilose; 3rd tergum metallic green, shiny, golden pilose laterally and on apical 1/2, black pilose basomedially; 4th tergum coppery green, shiny, golden pilose laterally and on apicomedial 1/3, black pilose basomedially; male genitalia orange, orange pilose.

**Length:** 12.5 mm, wing: 4.5 mm.

**Variation.** A couple of the females are bluish metallic, not green; one of the females from alcohol is purplish metallic and its scutellum is orange.

**Types. Holotype:** BRAZIL, Santa Catarina, Nova Teutônia, September 1969, Fritz PLAUMANN, ♂, deposited in the Canadian National Collection, Ottawa. **Paratypes:** same data as holotype, (1 ♂, USNM); same locality as holotype, November 1969, Fritz PLAUMANN (1 ♀, CNC). BRAZIL. São Paulo: São Bernardo, January 1965, MARTINEZ & D'ANDRETTA (1 ♀, MZUSP); Barueri, 2 April 1955, K. LENKO (#987, 1 ♀, MZUSP). Rio de Janeiro: Floresta da Tijuca, March 1959, C. A. CAMPOS SEABRA (1 ♀, MZUSP). Minas Gerais: Belo Horizonte, Campus UFMG, 31 December 1991, A. F. KUMAGAI (1 ♂, UFMG). Paraná: Colombo, EMBRAPA, BR 476, km 20, 29 December 1986, 19–26 January 1987, Lev. Ent. PROFAUPAR (1 ♂, 2 ♀ ♀, DZUP); Telêmaco Borba, Reserva Samuel Klabin, 15 September 1986, 13 October, 1986, 17 November 1986, Lev. Ent. PROFAUPAR (1 ♂, USNM, 2 ♂ ♂, DZUP); Ponta Grossa (Vila Velha), Reserva IAPAR, Br 376, 13, 20 October 1986, 3, 10, 17, 24 November 1986, 1 December 1986, Lev. Ent. PROFAUPAR (5 ♂ ♂, 3 ♀ ♀, DZUP, 1 ♀, USNM); Guarapuava, Estação Águas de Santa Clara, 6, 20 October 1986, 17 November 1986, 1 December 1986, 19 January 1987, Lev. Ent. PROFAUPAR (3 ♂ ♂, 2 ♀ ♀, DZUP).

**Remarks.** *Microdon aureopilis* runs to *caesar* CURRAN in the last published key to Neotropical *Microdon* species (CURRAN 1941: 248), but differs from *caesar* in having the scutum entirely golden pilose, not with intermixed black pile and metatibia and tarsus golden pilose, not with metatarsus black pilose. *Microdon aureopilis* is related to *mourei* and differs from it as noted above.

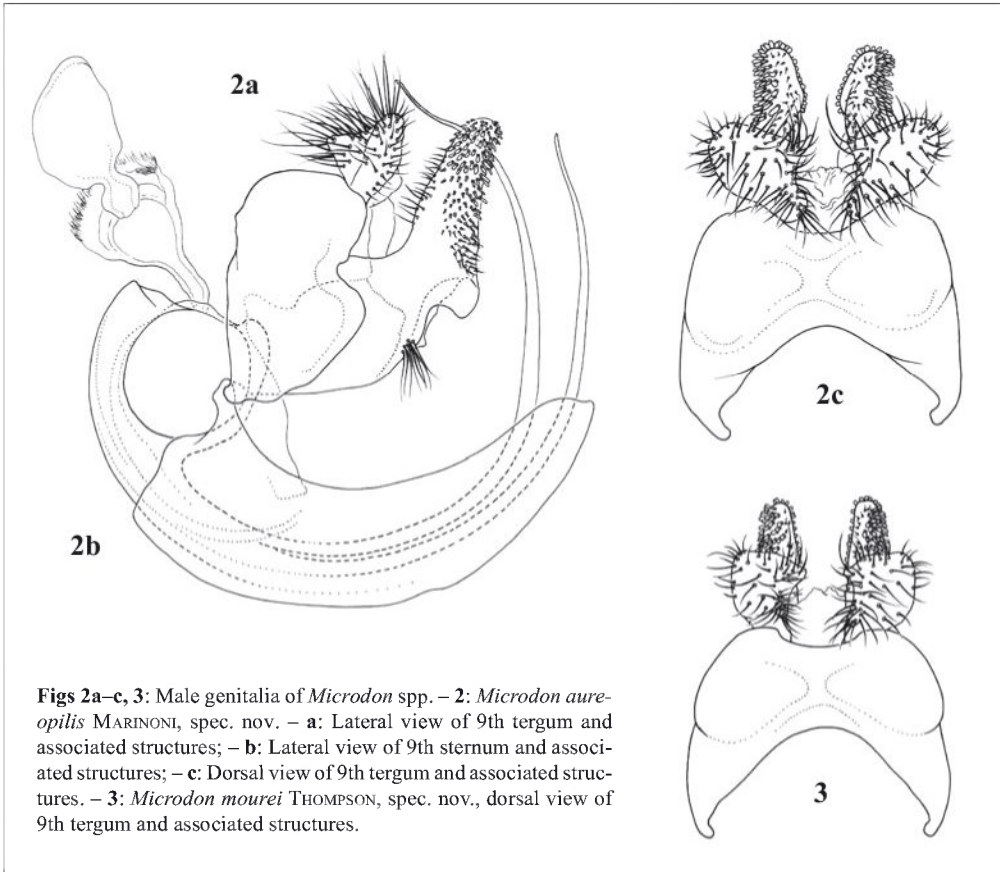
**Derivation of specific epithet.** The specific epithet is an adjective, referring to the color of the scutal pile.

***Microdon (Microdon) mourei* THOMPSON, spec. nov.**

(Fig. 3)

*Microdon* 74-11

**Adult (male & female). Head:** Metallic green; face shiny except very narrowly white pollinose laterally, yellowish white pilose; frontal lunule brownish orange; frons shiny, yellowish white pilose except black pilose medially; vertex shiny, yellow pilose except black pilose across ocellar triangle; ocellar triangle equilateral, small, well-isolated from eye margin; antenna brownish black, black pilose; antennal ratio 3:1:2; arista about 3/4 as long as basoflagellomere; eye very sparsely and short pilose, with pili about as long as ommatidial diameter; occiput sparsely white pollinose, white pilose ventrally becoming golden dorsally, with a few black pili intermixed on dorsal 1/3.



**Figs 2a–c, 3:** Male genitalia of *Microdon* spp. – **2:** *Microdon aureopilis* MARINONI, spec. nov. – **a:** Lateral view of 9th tergum and associated structures; – **b:** Lateral view of 9th sternum and associated structures; – **c:** Dorsal view of 9th tergum and associated structures. – **3:** *Microdon mourei* THOMPSON, spec. nov., dorsal view of 9th tergum and associated structures.

**Thorax:** Metallic green except for a large medial quadrate purple macula (this macula is clearly only for some views), shiny, long golden pilose; proepimeron bare; katapisternum without anteroventral pile patch; scutellum with apicolateral calcar; calypter white with orange margin; halter orange. **Wing:** hyaline, almost completely microtrichose; bare cell R except along spurious vein, posterobasal 1/3 of cell BM, anterobasal 1/5 of cell CuP and medially on alula. **Legs:** pro and mesocoxae and trochanters brownish black, golden pilose; metacoxa metallic green, yellowish-white pilose; metatrochanter brownish black, golden pilose; femora dark metallic green basally, orange apically; pro & mesofemora dark on basal 1/4 anteriorly, basal 2/3 posteriorly; metafemora dark on basal 1/3; tibiae and tarsi orange, orange pilose. **Abdomen:** Oval, 2nd segment about 1/2 as long as 3rd and 1/4 as long as 4th; sterna bluish green, shiny, long white pilose; 1st sternum well-developed; 1st & 2nd terga metallic bluish green, shiny, golden pilose; 3rd tergum metallic green, shiny, golden pilose; 4th tergum golden green, shiny, golden pilose; male genitalia orange, bare.

**Length:** 13 mm, wing: 9 mm.

**Types.** **Holotype:** Brazil, Santa Catarina, Nova Teutônia, January 1966, Fritz PLAUMANN, ♂, deposited in the Canadian National Collection, Ottawa (CNC). **Paratypes:** same locality as holotype, October 1966, Fritz PLAUMANN (1 ♀, USNM); BRAZIL, Paraná: Telêmaco Borba, Reserva Samuel Klabin, 6 October 1986, Lev. Ent. PROFAUPAR (1 ♂, USNM), ... 13 October 1986 (1 ♂, DZUP), ... 12 January 1987 (1 ♂, DZUP).

**Remarks.** *Microdon mourei* runs to *virgo* CURRAN in the last published key to Neotropical *Microdon* species (CURRAN 1941: 248), but differs from *virgo* in having the abdomen entirely metallic green and golden pilose. *Microdon virgo* has the abdomen dark purplish black with a pattern of white and black pile.

*Microdon mourei* is related to *aureopilus*, differing from it in having the legs extensively orange, not dark and having the abdomen entirely golden pilose, not with extensive black pile on the 4th tergum.

**Derivation of specific epithet.** The specific epithet is a noun, in the genitive case, in honor of Professor Doutor Padre Jesus Santiago MOURE, the true father of Systematic Entomology in southeastern Brazil. Since the early 1930s, Padre MOURE has been building collections of insects in Paraná and today, the insect collection at the Universidade Federal do Paraná bears his name in recognition of his contributions.

***Microdon (Pseudomicrodon) chrysostypus* THOMPSON, spec. nov.**

*Microdon* 65-2

**Adult (male & female).** **Head:** Face brownish yellow, darker medially in some specimens, white pilose; frons brownish black, yellow pilose; vertex pale brown, shiny, bare; occiput brownish black, gray pollinose, white pilose ventrally becoming yellow pilose dorsally; eye very sparsely and short pilose, with pili about as long as ommati diameter; antenna brown, black pilose; antennal ratio 3:1:4; basoflagellomere knife-shaped, with small sensory pit at apical 1/3; arista pubescent apically, with pile about as long as basal arista width, about 3/4 as long as basoflagellomere.

**Thorax:** Postpronotum yellow, rest of thorax dark brown; postpronotum yellow pilose; scutum black pilose except golden pilose in form small triangular maculae submedially on anterior edge, across transverse suture, dorsad to wings and onto postalar callus; pleuron golden pilose; scutellum brown, golden pilose, without calcars; calypter pale brown; halter orange; metasternum yellow pilose. **Wing:** hyaline except brown anteromedially; brown area filling costal cell and subcostal cell to level of stigmatic crossvein, cell BM on apical 3/4, cell R4+5 on basal 1/3, and along veins R4+5 and M; microtrichose except bare posterior to spurious vein in basal 3/4 of cell R, anterobasal 2/3 of cell BM, and basal 1/3 of cell CuP. **Legs:** light brownish orange except metacoxa and metatrochanter brown and metafemur may be darker on apical 2/3, yellow pilose except with black pile intermixed on posterior surface of pro and mesofemora; metafemur with anteroventral and posteroventral rows of short black spinose pile; metatibia with medioventral row of short black spinose pile.

**Abdomen:** Brown with apical margins of 2nd and 3rd terga orange and orange vittate macula on petiole, petiolate, with 2nd tergum flattened and with sublateral depression on basal 2/3, with 3rd and 4th segments forming a distinct club, with ratio of tergal lengths as 1:2.75:2.5:3, with 2nd about twice as long as wide and with parallel-sides, with 3rd tergum only slightly wider than long and about twice as wide apically as basally; 1st tergum golden pilose; 2nd tergum black pilose except golden along apical margin and on pale areas; 3rd tergum black pilose except golden pilose along apical margin; 4th tergum black pilose except submedial L-shaped fascia on posterior 2/3 of golden pile; genitalia yellow pilose.

**Length:** 13 mm, wing: 9 mm.

**Types.** **Holotype:** BRAZIL. Santa Catarina: Nova Teutônia, November 1965, Fritz PLAUMANN, ♂, from the personal collection of the author and to be deposited in the U. S. National Museum, Washington (USNM). **Paratypes:** Same locality and collector as holotype: 20 March 1947 (1 ♂, CNC), April 1952 (2 ♂♂, CNC, USNM), October 1952 (1 ♂, CNC), November 1957 (1 ♀, CNC), March 1964 (2 ♂♂, CNC), November 1964 (2 ♂♂, CNC), November 1966 (1 ♂, CNC), November 1968 (1 ♂, CNC), May 1968 (1 ♀, CNC), February 1970 (1 ♀, CNC), December 1950 (1 ♀, CNC).

**Remarks.** *Microdon chrysostypus* is very similar to *pilosops*, described below and also known from Nova Teutônia. These species differ from all described species of *Pseudomicrodon* by having the alula completely microtrichose. *Microdon chrysostypus* differs from *pilosops* in have rows of dense black spinose pile on metafemur, bare vertex, more extensive golden pile on scutum and on scutellum. In the last published key to neotropical *Microdon* (CURRAN 1941: 248), *chrysostypus* runs to either *beebei* CURRAN or *conops* CURRAN, depending how the face color is scored. *Microdon chrysostypus* differs from *beebei* in much smaller (12–13 mm versus 18–20 mm), having a unicolorous black scape (not bicolored, yellow basally, dark apically); and from *conops* by having extensive black pile on scutum (not entirely golden pilose).

**Derivation of specific epithet.** The specific epithet is an Latin adjective, referring to golden petiole of the abdomen.

*Microdon (Pseudomicrodon) pilosops* MARINONI, spec. nov.

(Fig. 4a-c)

*Microdon* 97-1

**Adult (male & female).** **Head:** Face broadly brown dorsomedially, yellow ventrolaterally, with brown area narrow ventrally, about 1/5 of facial width at oral margin expanding to full width at antenna, white pilose except black pilose medially; frons brownish black, black pilose and shiny except narrowly white pollinose and pilose laterally; vertex brown, brown pilose; occiput yellow and yellow pilose on ventral 1/3, brown and white pilose medially, brown, sparsely white pollinose and black pilose on dorsal 1/3; eye densely short pilose; antenna brown, black pilose; antennal ratio 4:1:4; basoflagellomere knife-shaped, with small sensory pit slightly anterior to arista; arista pubescent, with pile about as long as basal aristal width, about 3/4 as long as basoflagellomere.

**Thorax:** Dark brown including postpronotum, generally black pilose; white pilose along anterior margin of scutum, across transverse suture, on postalar callus, on posterior edge of anepisternum, on katepisternum and anepimeron, and in a triangular area anterior to scutellum; scutellum light brown, white pilose; calypter brown; halter yellow, with brownish club; metasternum black pilose. **Wing:** hyaline except brown basoanteriorly; brown area filling costal cell and subcostal cell to level of stigmatic cross-vein; microtrichose except bare posterior to spurious vein in basal 3/4 of cell R. **Legs:** light brownish orange except metacoxa and metatrochanter brown and metafemur may be darker on apical 2/3, white pilose except metatrochanter black pilose.

**Abdomen:** Brown with apical margins of 2nd and 3rd terga orange and indistinct orange vittate macula on petiole, petiolate, with 2nd tergum flattened and with sublateral depression on basal 2/3, with 3rd and 4th segments forming a distinct club, with 2nd and 3rd segments subequal and 4th about 1/4 longer, with 2nd tergum about 1/3 wider apically than long and about as wide basally as long; 1st tergum white pilose; 2nd tergum black pilose except golden along apical margin; 3rd tergum black pilose except golden pilose along apical margin; 4th tergum black pilose except medial fasciate and apicolateral patches of golden to yellow pile; genitalia black and white pilose.

**Length:** 15 mm, wing: 11 mm.

**Types. Holotype:** BRAZIL. Santa Catarina: Nova Teutônia, 24 October 1938, Fritz PLAUMANN, ♂, deposited in the Natural History Museum (BMNH), London. **Paratypes:** same locality as holotype, 14 November 1938, Fritz PLAUMANN (1 ♂, USNM), February 1968 Fritz PLAUMANN (1 ♂, CNC). BRAZIL. Paraná: Ponta Grossa (Vila Velha), Reserva IAPAR Br 376, 3 November 1986, Lev. Ent. PROFAUPAR (1 ♂, DZUP); Telêmaco Borba, Reserva Samuel Klabin, 3, 10, 30 November 1986, Lev. Ent. PROFAUPAR, Malaise trap (1 ♂, 2 ♀, DZUP); Jundiá do Sul, Fazenda Monte Verde, 22, 29 September 1986, 5, 6, 13, 20, 27 October 1986, 3, 17, 24 November 1986, Lev. Ent. PROFAUPAR, Malaise trap (17 ♂ ♂, DZUP, 1 ♂, USNM); Fênix, Reserva Estadual de Vila Rica (Instituto de Terras, Cartografia e Florestas), 8, 15, 29 September 1986, Lev. Ent. PROFAUPAR (4 ♂ ♂, DZUP).

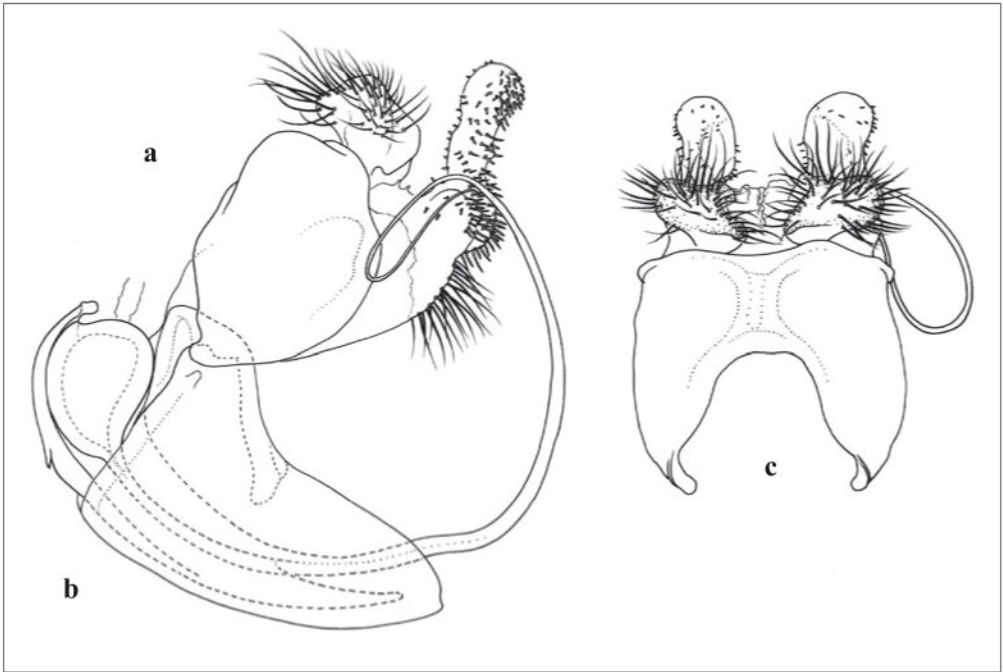
**Remarks.** *Microdon pilosops* is very similar to previously described *chrysostypus* also known from Nova Teutônia. These species differ from all described species of *Pseudomicrodon* by having the alula completely microtrichose. *Microdon pilosops* differs from *chrysostypus* in having a large triangle of yellow pile anterior to the scutellum. Also *pilosops* differs from all other species of this subgenus by its densely pilose eyes. In the last published key to neotropical *Microdon* (CURRAN 1941: 248), *pilosops* runs to *conops* CURRAN, which has bare eyes.

**Derivation of specific epithet.** The specific epithet is an adjective, referring to the pilose eyes.

*Mixogaster imitator* THOMPSON, spec. nov.

**Male. Head:** Face yellow except brown medial vitta and large black macula ventrad to antenna, white pilose; frontal lunule black; frons shiny black on anterior 1/2, yellowish becoming reddish to brownish black posteriorly, black pilose; vertex black, black pilose; occiput black except for 2 large lateral orange maculae, white pilose ventrally becoming brownish black dorsally; antenna light brown, black pilose; basoflagellomere knife-shaped, with dorsal margin straight and ventral margin arcuate, with small sensory pit near aristal insertation; arista orange, about 3/4 as long as basoflagellomere; antennal ratio 1:0.22:1





**Fig. 4a–c:** Male genitalia. – 4: *Microdon (Pseudomicrodon) pilosops* MARINONI; – **a:** Lateral view of 9th tergum and associated structures; – **b:** Lateral view of 9th sternum and associated structures; – **c:** Dorsal view of 9th tergum and associated structures.

**Thorax:** Generally brown; postpronotum yellow; scutum brown except for submedial orange macula on anterior margin, generally short appressed black pilose, with golden pile on submedial macula, along transverse suture and anterior to scutellum; postalar callus yellow, golden pilose; anepisternum bare; katepisternum long sparse white pilose; anepimeron long white pilose; katepimeron bare, faintly yellow along dorsal margin; scutellum brown except apical margin yellow, appressed golden pilose; metanotum as long as wide, sloping at 45° angle to horizontal axis of body, bare; calypter orange brown; halter orange with brown capitulum. Legs: orange except slightly brownish on dorsal surface of protibia and ventral surface of metafemur, orange pilose except with black pile intermixed dorsally on protibia. Wing: hyaline except brown anterior margin; brown area extends to vein R and spurious vein basally and to vein R4+5 apically; microtrichose except bare cell R and BM; vein M1+2 without spurs.

**Abdomen:** Generally brown; sterna brown except yellow apical margins on 2nd thru 4th sterna, white pilose; 1st tergum brown, white pilose; 2nd tergum triangular, about 3 times as wide apically as basally, slightly broad apically than long, brown except orange basolateral macula and apical margin, black pilose except white along apical margin; 3rd tergum brown with orange posterior margin, black pilose except white along posterior margin; 4th tergum brown with orange posterior margin, golden pilose on basolateral 2/3, black pilose on apicomедial 1/3; genitalia large, brown; 6th & 7th sterna with yellow apical margins; 8th sternum triangular, about as long as 3rd tergum, yellow pilose.

**Length.** 17.5 mm, wing 12 mm.

**Female.** Unknown.

**Types. Holotype:** BRAZIL. Santa Catarina; Nova Teutônia, 15 February 1936, Fritz PLAUMANN, ♂, from the personal collection of the author and to be deposited in the U. S. National Museum, Washington (USNM). **Paratypes:** Same locality as holotype: 12 February 1938 (1 ♂, BMNH). BRAZIL. Paraná, Telêmaco Borba, Reserva Samuel Klabin, 24 November 1986, Lev. Ent. PROFAUPAR, Malaise trap (1 ♂, DZUP).

**Remarks.** *Mixogaster imitator* is most similar and closely related to *sartocryptus* HULL. In the most recent keys to the species of *Mixogaster* (HULL 1954, CARRERA & LENKO 1958), *imitator* runs to *sartocryptus* without difficulty, but is easily distinguished from *sartocryptus* by having the basal cells (cell R & BM) hyaline and nearly bare, whereas these are brown and densely microtrichose in *sartocryptus*.

**Derivation of specific epithet.** The specific epithet is a noun in apposition and refers the strong mimetic appearance of this species.

***Copestylum profaupar* MARINONI, spec. nov.**

*Copestylum* 93-2

**Female. Head:** Bluish black; face shiny except white pollinose ventrad to antenna and laterally to eye, white pilose, with facial tubercle distinct and large, slightly concave dorsad to tubercle and straight ventrad to tubercle; gena with indistinct narrow yellow pollinose vitta; frontal lunule shiny; frons and vertex black, shiny, white pilose; ocellar triangle black, shiny, black pilose; occiput entirely white pollinose, white pilose ventrally becoming black pilose on dorsal 1/4; antenna light brown, black pilose; basoflagellomere elongate, about twice as long as broad, with small basoventral sensory pit; arista orange on basal 2/3, dark apically, with rays black, longer than the basoflagellomere;

**Thorax:** Bluish black except postpronotum, scutellum and postalar callus brownish, shiny; scutum shiny, black pilose except for 5 vittate of short white pile; anepisternum, katapisternum and anepimeron black shiny; katapisternum short pilose; scutellum short black pilose except white pilose basally, with subscutellar fringe white, with 4–5 pairs of short marginal bristles, punctate; plumula black; calypter white with black margin and fringe; halter orange. **Wing:** hyaline except dark apicoanteriorly, bare except microtrichose anteriorly and along margins; alula bare; brown and microtrichose as follows: cells C (hyaline to light brown apically) on apical 3/4, Sc, r1 except hyaline basal 1/4, r2+3, apical 1/4 of cell R, apical 1/4 of R4+5 and along crossvein bm-cu and vein CuA1 at apex of cell BM; also microtrichose along posterior margin of wing beyond cells; cell R1 closed, petiolate and slightly expanded apically. **Legs** dark reddish brown to black, black pilose except metacoxa white pilose.

**Abdomen:** Bluish black, shiny, white pilose, extensively punctate.

**Length:** 8 mm, wing: 7 mm.

**Male.** Unknown.

**Types. Holotype:** BRAZIL. Santa Catarina: Nova Teutônia, 17 October 1938, Fritz PLAUMANN, ♀, deposited in the Natural History Museum, London (BMNH). **Paratypes:** Brazil, Paraná, Fênix, Reserva Estadual (Instituto de Terras, Cartografica e Florestas), 22 Sept 1986, Lev. Ent. PROFAUPAR, Malaise trap (♀, DZUP); Foz do Iguaçu, 7 Dec 1966, "Exc. Dept. Zoo." (1 ♀, USNM).

**Remarks.** In the last published key to *Copestylum* species (CURRAN 1939), *profaupar* runs to couplet #58, *azurea* PHILIPPI and *saphirina* BIGOT, but is easily separated from both by its wing pattern: *saphirina* is without wing pattern; *azurea* has a large median quadrate black macula; and *profaupar* has the anteroapical margin brownish-black.

**Derivation of specific epithet.** The species epithet, *profaupar*, is an arbitrary combination of letters representing the name of the project and is to be treated as a noun in apposition.

***Myolepta (Protolepidostola) marinonii* MARINONI, spec. nov.**

*Myolepta* 99-10

**Female. Head:** Black; face shiny except grayish-white pollinose ventrad to antenna, white pilose on ventral 1/4; facial stripe white pollinose; gena shiny except narrowly white pollinose along eye margin, white pilose; lunule shiny; frons shiny except narrowly grayish-white pollinose along eye margins, white pilose except medially bare, with medial groove on dorsal 2/3, laterad to groove punctate due to large areolae of pile; vertex shiny, largely bare, with some brown pile on posterior 1/2 of ocellar triangle; occiput white pollinose, white pilose on ventral 2/3, black pilose dorsally; antenna brownish orange, yellow pilose.

**Thorax:** Black; postpronotum shiny except grayish white pollinose anteromesially, black pilose; scutum shiny except narrowly grayish white pollinose anteriorly, appearing punctate due to large aveolar pits, black pilose, with pile very short and depressed, with scattered white scales; scutellum triangular, not produced dorsoapically, shiny, with pile and scales as on scutum, without subscutellar fringe, with a marginal row of scales; pleuron shiny except pro- and metathoracic areas gray pollinose, with scattered white scales; metasternum bare; calypter white, with margin and fringe brown; halter yellow. Wing: light brownish, microtrichose except narrowly bare basoposteriorly on costal and 2nd basal cells, basoanteriorly on anal cell. Legs: procoxa black, grayish white pollinose, white pilose; mesocoxa shiny except mesially gray pollinose, black pilose; metacoxa shiny except mesially gray pollinose, white pilose; trochanters black, shiny; femora black, shiny, black pilose; tibiae black, black pilose; protarsus black except yellow laterally on basitarsomere, black pilose except yellow pilose on basal 2 tarsomeres; mesotarsus yellow, yellow pilose except black, black pilose on apical 3 tarsomeres; metatarsus brownish black, black pilose except yellow pilose on basal 2 tarsomeres.

**Abdomen:** Dorsum bluish black; 1st tergum gray pollinose, white pilose; 2nd tergum gray pollinose except shiny laterally and with black pollinose transverse macula on apical 1/3, white pilose except black pilose on apical 1/2; 3rd tergum gray pollinose except shiny laterally and with black basomedial maculae, black pilose except white pilose laterally; 4th tergum shiny except narrowly black pollinose basomedially, white pilose; 5th tergum shiny, white pilose; sterna gray pollinose, white pilose.

**Length:** 7 mm, wing: 5.5 mm.

**Male:** Unknown.

**Types. Holotype:** BRAZIL. Paraná: Ponta Grossa (Vila Velha), Reserva IAPAR Br376, 12 January 1987, “Lev. Ent. PROFAUPAR, Malaise.” ♀, deposited in collection of Departamento de Zoologia, Universidade Federal Paraná, Curitiba (DZUP). Paratypes: Same locality as holotype, 6 October 1986 (1 ♀ DZUP); Guarapuava, Estação Águas de Santa Clara, 10 November 1986, Lev. Ent. PROFAUPAR (1 ♀ USNM).

**Remarks.** *Myolepta marinonii* belongs to the subgenus *Protolepidostola* which contains 3 species and is restricted to the Neotropics (THOMPSON 1968, 1974). *Myolepta marinonii* is readily distinguished from all other species of *Protolepidostola* by its dark tarsi and abdomen.

**Derivation of specific epithet.** The specific epithet is a noun in apposition in honor of my father, Renato Contin MARINONI, who introduced me to Science with enthusiasm and has been responsible for great projects such as PROFAUPAR.

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The senior author initiated this study, while doing the preliminary sorting and identification to morphospecies. Together we prepared this first manuscript and the descriptions of the new species. Some of the new species had been previously recognized by the junior author and these are identified by his numerical code numbers.

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