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New records of the Brazilian Anthomyiidae (Diptera) and a checklist of species from Palmas Grasslands Wildlife Refuge

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Abstract

The Anthomyiidae (Insecta, Diptera) include 1,941 species in 53 genera that are found in a wide range of habitats (forests, cities, agricultural fields). Herein, the anthomyiid fauna of the Atlantic Forest of Palmas (south of the state of Paraná) was surveyed using Malaise traps at altitudes higher than 1,000 meters. The collection of these flies was conducted in Palmas Grasslands Wildlife Refuge (PGWR) that is a full protection conservation unit (CU) surrounded by degraded areas and with high levels of endemism. A total of 12 species of anthomyiid flies (42.3% of Brazilian species) and 7 genera (58.3% of Brazilian genera) were identified, including 9 new records to Paraná (*Anthomyia plurinervis* (Albuquerque, 1958), *A. xanthopyga* (Albuquerque, 1959), *Calythea comis* (Stein, 1911), *Coenosopsia ferrari* Nihei & de Carvalho, 2004, *Emmesomyia auricollis* (Stein, 1918), *E. sobria* (Albuquerque & Couri, 1981), *Leucophora maculipennis* (Albuquerque, 1953), *Pegomya bruchi* (Shannon & Del Pont, 1926) and *P. poeciloptera* Malloch, 1921). Also, we examined some specimens deposited in the Department of Zoology, Universidade Federal do Paraná, the Museu Nacional, Universidade Federal do Rio de Janeiro, and the Museu de Zoologia da Universidade de São Paulo in order to update species' distribution, leading to a new record for Rio Grande do Sul (*Pegomya poeciloptera* Malloch, 1921) and 3 new records for Santa Catarina (*Anthomyia pluripunctata* (Albuquerque, 1959), *Calythea comis* (Stein, 1911), *Leucophora maculipennis* (Albuquerque, 1953)). A key to the local genera and diagnoses of species are provided.

Key words

Biodiversity, conservation unit, faunistic survey, Muscoidea, Neotropical Region.

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Introduction

Anthomyiid flies (Diptera, Calyptratae) include 1,941 species and 53 genera distributed worldwide (Pape et al. 2011). In Brazil, 26 species have been recorded in 12 genera (de Carvalho and Couri 2018). These flies can be easily distinguished from other calyptrates by having fine setae on the ventral surface of the scutellum, except in *Coenosopsia* Malloch, 1924 and *Fucellia* Robineau-Desvoidy, 1842, and by the long vein A_1 reaching wing margin, also except in *Coenosopsia* (Michelsen 2010).

Most anthomyiid species occur in areas with temperate and arctic climates. Adults are found in a wide range of habitats. A few species are synanthropic and others

are agricultural pests, for instance, species of *Delia* Robineau-Desvoidy, 1830 and *Pegomya* Robineau-Desvoidy, 1830 (Huckett 1971, 1987, Evenhius 2007), while some genera are composed of pollinator species (*Anthomyia* Meigen, 1803 and *Delia*) (Rader et al. 2009, Savage et al. 2016). Nonetheless, little is known about the anthomyiid fauna of the Neotropical Region (Pont 1974), including the life history of most species (Huckett 1971). The latest studies of Neotropical Anthomyiidae are mainly taxonomic, including species descriptions and redescriptions of *Coenosopsia* (Michelsen 1991, Nihei and de Carvalho 2004, Bortolanza et al. 2006) and *Anthomyia* (Albuquerque and Couri 1979, Pamplona 1991), an identification key of the Neotropical genera (Pamplona 1992) and a cladistic and biogeographic analysis of *Coenosopsia* (Nihei and de Carvalho 2004).

The Palmas Grasslands Wildlife Refuge (PGWR) is a fully protected conservation unit (CU) located in southern Paraná state, Brazil. The vegetation there is part of the Atlantic Forest biome and includes grasslands (also known as Southern Fields), riparian and isolated forests across the landscape, and araucaria moist forest. According to the climate classification of Köppen, the climate is Oceanic (Cfb), daily average temperature is 18 °C in cooler months and 22 °C in the warmer months. Summers are cool, frosts are frequent and there is no well-defined dry season. Altitudes in the refuge vary between 1,035 and 1,356 m a.s.l. (Maack 2002).

The relief of the area encompassed by the PGWR results in a particular environmental condition that is reflected in high endemism, species richness and genetic diversity (Barros et al. 2015). Only a few faunistic studies have been conducted in the Southern field areas of Brazil (Bencke 2009). This work aimed to study the fauna of Anthomyiidae of the PGWR to add information on the biology and distribution of species.

Methods

Flies were collected at Palmas Grasslands Wildlife Refuge (PGWR) (Fig. 1), Paraná (Brazil), from September 2012 to December 2014, using 8 Malaise traps, duplicated in 4 designated collecting areas (average distance among traps = 100 m): native forest fragment (*Af*); forest edge (*Ae*); grasslands (*Ag*) and a regeneration area where *Pinus taeda* L. was removed (*Ar*). Geographic coordinates for these sites were 51.6738° S, 26.5022° W for the *Af* site; 51.6747° S, 26.5011° W for the *Ae* site; 51.6755° S, 26.5025° W for the *Ag* site, and 51.5422° S, 26.5572° W for the *Ar* site.

Additionally, anthomyiids from the Coleção Entomológica Padre Jesus Santiago Moure, Zoology Department, Universidade Federal do Paraná (DZUP-UFPR), the Museu Nacional do Rio de Janeiro (MNRJ), and the Museu de Zoologia da USP (MZUSP) were analyzed to update the distribution of species found in PGWR. Due to the scarce Anthomyiidae literature, information on the biology of each species was presented when available.

Anthomyiid flies were identified based on available keys (Bortolanza et al. 2006, Michelsen 2010, Savage et al. 2016), descriptions, and reference material deposited in DZUP, MNRJ, and MZUSP. The auto-montage stereomicroscope images were taken by the Taxonline project (UFPR; http://www.taxonline.ufpr.br/). The collected specimens were deposited among the DZUP (pinned specimens) and Laboratório de Biodiversidade e Biogeografia de Diptera, UFPR (LabDip) (alcohol-preserved specimens). The terminology follows Cumming and Wood (2009).

Results

The checklist of Anthomyiidae from Palmas Wildlife Refuge (PGWR) has 12 species in 7 genera and 4 unidentified species in 2 genera. Information on where each species was collected in PGWR is provided on Table 1.

Key to genera of Anthomyiidae from Palmas (Paraná)

1 Prosternum ciliated; lower calypter larger than upper calypter; hind tibia with 1 seta on posterodorsal surface ..... ***Calythea*** Schnabl & Dziedzicki, 1911 (1 sp.)
— Prosternum bare; calypteres variable in size; hind tibia with 1–5 setae on posterodorsal surface 2
2 Arista with long hairs; hind tibia on posterodorsal surface with 1 seta; scutellum bare ventrally; vein A_1+CuA_2 not reaching wing margin ..... ***Coenosopsia*** Malloch, 1924 (2 spp.)
— Arista variable; hind tibia on posterodorsal surface with 2–5 setae; scutellum ciliated ventrally; vein A_1+CuA_2 reaching wing margin 3
3 Vein C bare on ventral surface 4
— Vein C ciliated on ventral surface (Fig. 3) 5
4 Head enlarged in lateral view, parafacial and gena much wider than comparatively small postpedicel (2× longer than pedicel length) ..... ***Leucophora*** Robineau-Desvoidy, 1830 (1 sp.)
— Head not enlarged in lateral view, parafacial and gena similar to postpedicel width (3× longer than pedicel length) ..... ***Delia*** Robineau-Desvoidy, 1830 (1 sp.)
5 Wing with spot 6
— Wing without spot ..... ***Emmesomyia*** Stein, 1918 (2 spp.)
6 Frontal vitta with pair of interfrontal setae ..... ***Anthomyia*** Meigen, 1803 (4 spp.)
— Frontal vitta without interfrontal setae ..... ***Pegomya*** Robineau-Desvoidy, 1830 (2 spp.)

List of species

Anthomyiidae Meade, 1875
Anthomyia Meigen, 1803

***Anthomyia plurinervis* (Albuquerque, 1958)**
Figure 2

Hylemyioides plurinervis Albuquerque 1958: 341. Type locality: Brazil, Rio de Janeiro, Petrópolis, Le Vallon, Alto da Mosela. Pont 1974: 6 (catalogue), de Carvalho et al. 2002: 108 (key).

Figure 1. Location of Palmas Grasslands Wildlife Refuge (PGWR), Paraná, Brazil.

Table 1. Checklist of the species of Anthomyiidae recorded to Palmas Grasslands Wildlife Refuge, Paraná, Brazil, and its respective total distribution, and number of specimens found in each studied area. *New records of distribution for Brazil. Countries abbreviations: AR, Argentina; AU, Australia; BR, Brazil; CL, Chile; LH, Lord Howe Island; NZ, New Zealand; PY, Paraguay; SA, South Africa; UY, Uruguay; US, United States. States abbreviations: AM, Amazonas; DF, Distrito Federal; MG, Minas Gerais, PR, Paraná; RJ, Rio de Janeiro; RG; SC, Santa Catarina. Area abbreviations: *Af*, native forest fragment; *Ae*, edge of native forest fragment; *Ag*, grasslands; *Ar*, regeneration area where *Pinus taeda* L. had been removed.

Species	Distribution	Af	Ae	Ag	Ar	Total abundance
Anthomyia plurinervis (Albuquerque, 1958)	BR (RJ, PR*) (Albuquerque 1958)		1			1
Anthomyia pluripunctata (Albuquerque, 1959)	BR (SP, PR, SC*) (Albuquerque 1959)	1			2	3
Anthomyia punctipennis (Wiedemann, 1930)	US (Albuquerque 1959), BR (AM, RJ, SP, RS, PR) (Albuquerque 1959; de Carvalho et al. 2002), CL, AR, UR (Michelsen 1997), SA (Ackland 2001); AU, NZ, LH (Evenhuis 2007)				1	1
Anthomyia xanthopyga (Albuquerque, 1959)	BR (SP, PR*) (Albuquerque 1959)	1			3	4
Calythea comis (Stein, 1911)	AR, BR (MG, RJ, PR*, SC*) (Albuquerque 1953), CL (Malloch 1934)	1		9	2	12
Coenosopsia brasiliensis Michelsen, 1991	BR (RJ, PR, SC), PY(Bortolanza et al. 2006)	1				1
Coenosopsia ferrari Nihei & de Carvalho, 2004	BR (DF, PR*) (Nihei and de Carvalho 2004)	47	40	10	108	205
Emmesomyia auricollis (Stein, 1918)	BR (RJ, SP, PR*, SC) (Albuquerque and Couri 1979)				2	2
Emmesomyia sobria (Albuquerque & Couri, 1981)	BR (PR*, SC) (Albuquerque and Couri 1981)				2	2
Leucophora maculipennis (Albuquerque, 1953)	BR (RJ, SP, PR*, SC*) (Albuquerque 1953)				147	147
Pegomya bruchi (Shennon & Del Pont, 1926)	AR (Malloch, 1934), BR (RJ, PR*) (Albuquerque 1959)				2	2
Pegomya poeciloptera Malloch, 1921	AR, BR (PR*, SC, RS*) (Albuquerque 1959)	3		4	6	13
Undetermined species						
*Anthomyia*sp. 1	BR (PR)		3	41	20	64
*Anthomyia*sp. 2	BR (PR)				3	3
*Anthomyia*sp. 3	BR (PR)	1		3	2	6
Delia sp.	BR (PR)	1		15	67	83
Total						549

Diagnosis. Ground-color dark brown, with areas of gray pruinosity. Legs brown, tibiae yellowish. Two dorsal stripes on thorax. Dorsocentral setae 2+3. Prealar seta strong, similar to anterior notopleural seta. Katepisternal setae 1+1+1. Branches in medial and pre-medial portions of vein R_{2+3}, each one in opposite directions. Vein *dm-cu* straight. Vein A_1+CuA_2 not reaching the wing margin. Wing with spots on vein R_1 apex, vein R_{2+3} branches, vein *r-m* and vein *dm-cu*. Wing margin darkened between vein R_{2+3} and vein R_{4+5}.

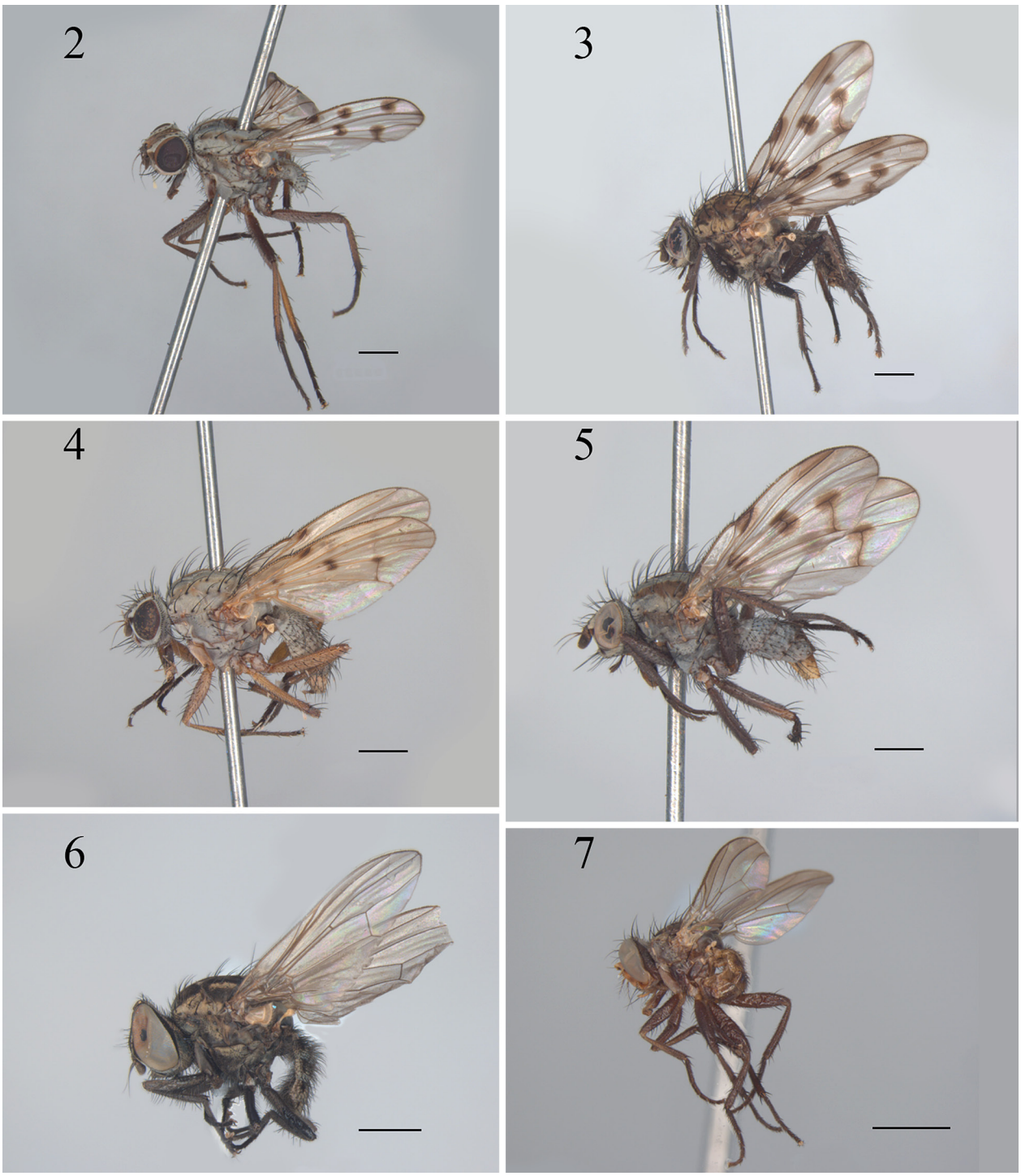
Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ae*, 13.ii.2014 (LabDip); 3 ♂ and 1 ♀, Curitiba, Represa de Piraquara II, 19.i.2000, C.J.B. de Carvalho (DZUP).

Distribution. Brazil: Rio de Janeiro, (Albuquerque 1958).

Biology. According to label information, some specimens from Curitiba were collected with fermented fruit (sugar cane juice).

New records. Paraná (Curitiba and Palmas).

***Anthomyia pluripunctata* (Albuquerque, 1959)**
Figure 3



Figures 2–7. Habitus in lateral view. **2.** *Anthomyia plurinervis* (Albuquerque, 1958). **3.** *Anthomyia pluripunctata* (Albuquerque, 1959). **4.** *Anthomyia punctipennis* (Wiedemann, 1930). **5.** *Anthomyia xanthopyga* (Albuquerque, 1959). **6.** *Calythea comis* (Stein, 1911). 7. *Coenosopsia brasiliensis* Michelsen, 1991. Scale bars = 1 mm.

Hylemyia pluripunctata Albuqueque 1959: 30. Type locality: Brazil, São Paulo, Eugène Lefèvre. Pont 1974: 3 (catalogue), de Carvalho et al. 2002: 108 (key).

Diagnosis. Ground-color dark brown, with areas of yellow pruinosity. Legs brown. Dorsocentral setae 2+3. Prealar seta strong, longer than anterior notopleural seta. Katepisternal setae 2+2. Vein *dm-cu* curved. Vein A_1+CuA_2 reaching the wing margin. Wing with spots on vein *h*, vein R_1 apex, vein R_{2+3} base, vein R_{4+5} pre-apex and apex, vein *M* apex, vein *r-m* and 2 on vein *dm-cu* corners.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, CPWR, A.C. Pereira col., inside forest, 26.viii.2014 (LabDip); 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 21.ix.2012 (LabDip); 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 6.x.2012 (DZUP); 1 ♀, Ponta Grossa, Vila Velha: 28.viii.2000, Ganho and Marinoni col., (DZUP); 2 ♀, Curitiba: viii.1980, C. B. Jesus col., (DZUP); 1 ♀, Curitiba, ix.1980, C. B. Jesus col., (DZUP); 1 ♂, Curitiba, x.1980, C. B. Jesus col., (DZUP); 1 ♂, São José dos Pinhais, Serra do Mar, BR277 km 54, 23–30.vii.1984 (CIIF)

(DZUP); same locality and collector: 1 ♂, 10-17.ix.1984; 3 ♂, 1–8.x.1984; 1 ♀, 8-16.x.1984; 1 ♂, 8–19.x.1984; 1 ♂, 20.x.1986; 1 ♀, 5.x.1986 (DZUP); Santa Catarina: 1 ♀, Nova Teutônia, iv.1967, Fritz Plaumann (MZUSP); same locality and collector: 1 ♀, viii.1967; 1 ♂, x.1967; 1 ♂, xi.1967; 1 ♂, v.1971 (MZUSP).

Distribution. Brazil: São Paulo, Paraná (Albuquerque 1959).

Biology. According to label information, some specimens from Curitiba were collected with light trap, malaise trap and on liver, sardine and decayed onions, both in urban and forest environment. It is a synanthropic species (de Carvalho et al. 2002).

New record. Santa Catarina (Nova Teutônia)

Anthomyia punctipennis Wiedemann, 1830

Figure 4

Anthomyia punctipennis Wiedemann 1830: 435. Type locality: Uruguay, Montevideo. Malloch 1934: 180 (key), Pont 1974: 3 (catalog), de Carvalho et al. 2002: 108 (key).

Hylemyia punctipennis Shannon and Del Ponte 1926: 24 (preoccupied, Wiedemann, 1830). Type locality: Argentina, San Isidro. Synonymy by Shannon and Del Ponte 1928: 142.

Diagnosis. Ground-color light brown, with areas of gray pruinosity. Legs yellow, except tarsomeres brown. Dorsocentral setae 2+3. Prealar seta strong, similar to anterior notopleural seta. Katepisternal setae 2+2. Vein *dm-cu* straight. Vein A_1+CuA_2 reaching the wing margin. Wing with spots on vein R_1 apex, vein *r-m*, 2 on vein *dm-cu* corners (the inferior one inconspicuous) and an inconspicuos spot between vein R_{4+5} and vein *M* base.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 10.vii.2013 (LabDip); 1 ♀, Curitiba, 17.i.1984, M. L. Silva and A. C. Saad (DZUP).

Distribution. United States of America (Albuquerque 1959); Brazil (Amazonas, Rio de Janeiro, São Paulo, Rio Grande do Sul (Albuquerque, 1959) Paraná (de Carvalho et al. 2002)); Chile; Argentina; Uruguay (Michelsen 1997)). This species was introduced in South Africa (Ackland 2001), Australia, New Zealand and Lord Howe Island (Evenhuis, 2007).

Biology. Synanthropic species (de Carvalho et al. 2002).

Anthomyia xanthopyga (Albuquerque, 1959)

Figure 5

Hylemyia xanthopyga Albuquerque 1959: 39. Type locality: Brazil, São Paulo, Campos do Jordão. Pont 1974: 3 (catalogue), de Carvalho et al. 2002: 108 (key).

Diagnosis. Ground-color dark brown, with areas of gray pruinosity. Three brown dorsal stripes on thorax. Legs brown. Dorsocentral setae 2+3. Prealar seta strong, similar to anterior notopleural setae. Katepisternal setae 2+2. Vein *dm-cu* slightly curved. Vein A_1+CuA_2 reaching the wing margin. Wing with spots on apex of veins R_1, R_{2+3}, R_{4+5} and vein *M*, between vein R_{4+5} and vein *M* base, vein *r-m* and 2 on vein *dm-cu* corners. Tergite 5 yellow.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, *Ar*, 10.vii.2013, A.C. Pereira col., (LabDip); same locality and collector: 1 ♀, *Ar*, 20.xii.2012 (LabDip); 1 ♀, *Af*, 26.viii.2014 (LabDip); 1 ♀, *Ar*, 6.xii.2012 (DZUP); 1 ♀, Ponta Grossa, Vila Velha, Reserva IAPAR Br 376: 5.x.1986, PROFAUPAR (DZUP); 1 ♀, Curitiba, ix.1980, C. B. Jesus col., (DZUP); 1 ♀, Curitiba, xi.1980, C. B. Jesus col., (DZUP); 1 ♀, Curitiba, iii.1981, C. B. Jesus col., (DZUP); 1 ♂, Curitiba, 12.i.1984, M. L. Pilloto and A. Carine col., (DZUP); 1 ♀, Curitiba, 28–29.vi.1984, R. Zonta e M. Santos col., (DZUP).

Distribution. Brazil (São Paulo) (Albuquerque, 1959).

Biology. According to label information, some specimens from Curitiba were collected with light trap and from liver, sardine and onion decay, both in urban and forest environment.

New record. Paraná (Curitiba, Palmas, Ponta Grossa).

Anthomyia sp. 1

Diagnosis. Similar to *A. punctipennis*, but weak clouds absent between vein R_{4+5} and vein *M* and male genitalia.

Material examined. BRAZIL. Paraná: 1 ♂ and 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 1.xi.2012 (DZUP); same locality and collector: 1 ♀, *Ar*, 2.v.2013 (DZUP); 1 ♂, *Ae*, 9.i.2014 (DZUP); 2 ♀, *Ar*, 9.viii.2013 (DZUP); 1 ♂, grassland, 9.xii.2013 (LabDip); 1 ♀, *Ar*, 10.i.2013 (LabDip); 2 ♀, *Ar*, 10.vii.2013 (LabDip); 1 ♂, *Ag*, 16.i.2014 (LabDip); 1 ♀, *Ar*, 19.x.2012 (LabDip); 2 ♀, *Ar*, 20.xii.2012 (LabDip); 2 ♂, grassland, 20.xii.2013 (LabDip); 2 ♀, *Ar*, 21.ix.2012 (LabDip); 1 ♀, *Ar*, 22.iii.2013 (LabDip); 1 ♀, *Ag*, 23.i.2014 (LabDip); 1 ♀, *Ar*, 23.ix.2013 (LabDip); 2 ♀, *Ar*, 24.i.2013 (LabDip); 2 ♀, *Ar*, 25.vii.2013 (LabDip); 1 ♂, forest edge, 28.ii.2013 (LabDip); 1 ♀, *Ar*, 28.vi.2013 (LabDip); 1 ♀, *Ag*, 29.x.2014 (LabDip); 1 ♀, *Ar*, 5.iv.2013 (LabDip); 26 ♂ and 9 ♀, *Ag*, 9.xii.2013 (LabDip).

Anthomyia sp. 2

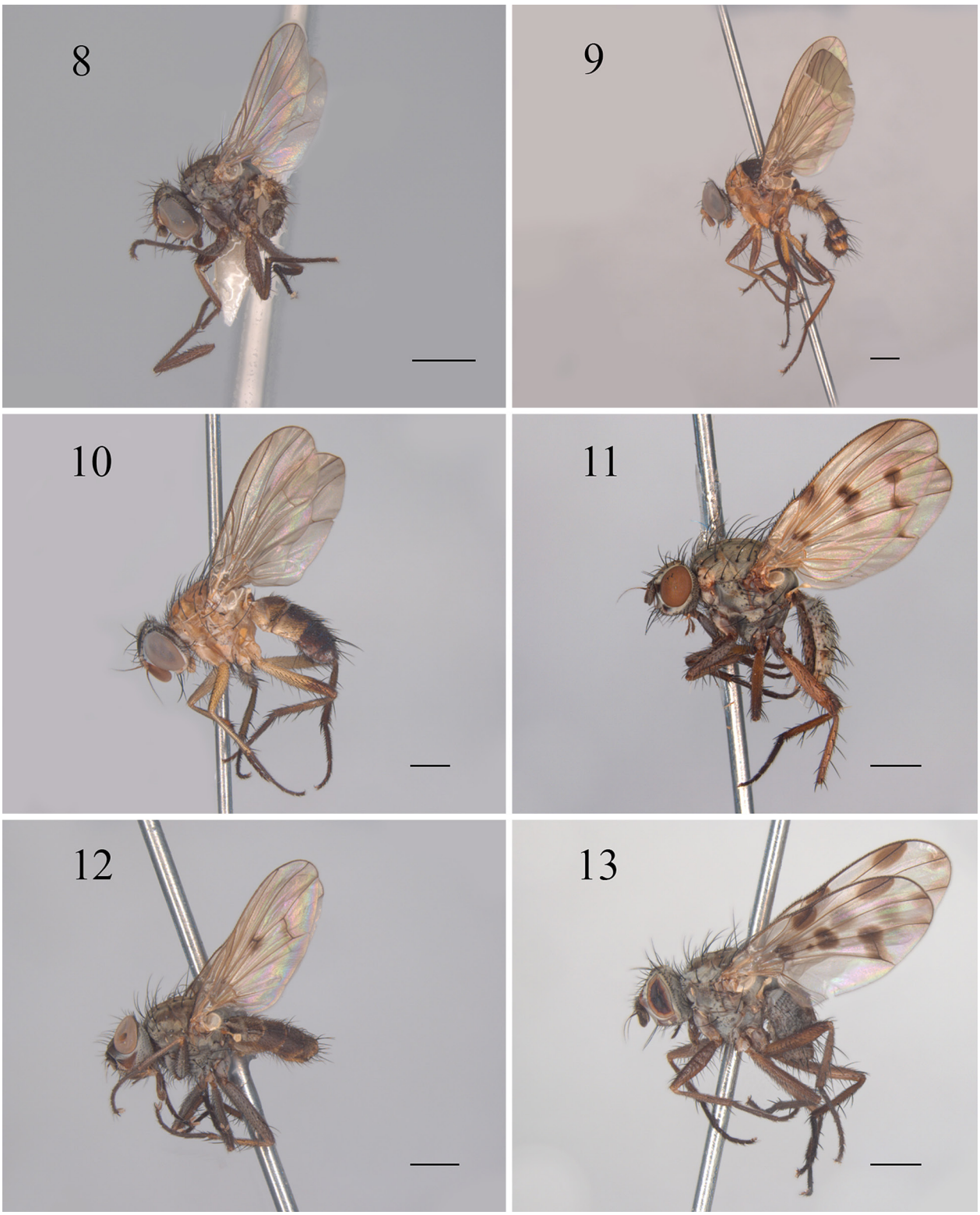
Diagnosis. Similar to *A. punctipennis*, the wing clouds, ground-coloration and genitalia differ. The current taxonomy of *Anthomyia* does not allow for a precise identification of this morphospecies.

Material examined. BRAZIL. Paraná: 1 ♂, Palmas, PGWR, A.C. Pereira col., *Ar*, 20.xii.2012 (LabDip); same locality and collector: 1 ♂ (LabDip) and 1 ♀, *Ar*, 21.ix.2012 (DZUP).

Anthomyia sp. 3

Diagnosis. Similar to *A. xanthophyga* , but having different ground-coloration of the sternite and tergite 5 and male terminalia.

Material examined. BRAZIL. Paraná: 1 ♂, Palmas, PGWR, A.C. Pereira col., *Ar*, 3.xii.2013 (DZUP); same



Figures 8–13. Habitus in lateral view. **8.** *Coenosopsia ferrari* Nihei and de Carvalho, 2004 (paratype). **9.** *Emmesomyia auricollis* (Stein, 1918). **10.** *Emmesomyia sobria* (Albuquerque & Couri, 1981). **11.** *Leucophora maculipennis* (Albuquerque, 1953). **12.** *Pegomya bruchi* (Shannon and Del Pont, 1926). 13. *Pegomya poeciloptera* Malloch, 1921. Scale bars = 1 mm.

locality and collector: 1 ♀, *Ag*, 5.vii.2014 (DZUP); 1 ♀, *Ag*, 23.i.2014 (LabDip); 1 ♀, *Ar*, 23.ix.2013 (DZUP); 1 ♀, *Af*, 29.vii.2014 (LabDip); 1 ♀, *Ag*, 29.vii.2014 (LabDip).

Calythea Schnabl & Dziedzicki, 1911

***Calythea comis* (Stein, 1911)**
Figure 8

Anthomyia comis Stein 1911: 155.Type locality: Chile, Tacna. Malloch 1934: 174 (catalogue), Albuquerque 1953: 543 (catalogue), Pont 1974: 2 (catalogue).

Diagnosis. Ground-color dark brown, with areas of golden pruinosity. Eyes ciliated. Golden pruinosity on notopleural region. Legs dark brown. Dorsocentral setae 2+3. Prealar seta short, half of anterior notopleural seta

length. Katepisternal setae 1+3. Vein *dm-cu* straight. Vein A_1+CuA_2 reaching the wing margin. Wing hyaline.

Material examined. BRAZIL. Paraná: 4 ♀, Palmas, PGWR, A.C. Pereira col., *Ag*, 29.x.2014 (LabDip); same locality and collector: 1 ♂ and 1 ♀, *Ag*, 20.x.2014 (DZUP); 1 ♀, *Ar*, 3.xii.2013 (DZUP); 1 ♂, *Af*, 12.vii.2014 (LabDip); 1 ♂, *Ag*, 16.i.2014 (LabDip); 1 ♂, *Ar*, 21.ix.2012 (DZUP); 1 ♀, *Ag*, 28.iv.2014 (DZUP); 1 ♂, *Ag*, 9.xii.2013 (DZUP); 3 ♂, Castro, ix.1961, S. Laroca col. (DZUP). Santa Catarina: 1 ♂, Itajaí, EMPASC, ix.1988, C. Paloschi col. (DZUP).

Distribution. Argentina, Brazil (Minas Gerais and Rio de Janeiro) (Albuquerque 1953) and Chile (Malloch 1934).

New record. Paraná (Palmas) and Santa Catarina (Itajaí).

Coenosopsia Malloch, 1924

***Coenosopsia brasiliensis* Michelsen, 1991**
Figure 6

Coenosopsia brasiliensis Michelsen 1991: 102. Type locality: Brazil, Rio de Janeiro. Nihei and de Carvalho 2004: 262 (key), 4–5 (phylogeny), 8 (biogeography), Bortolanza et al. 2006: 40 (key), 13 (male genitalia), 14 (phylogeny), 15 (biogeography).

Diagnosis. Proboscis brown. Palpus and antenna yellow. All tergites brown, partially yellow. Cercus and surstylus straight. Cercus short, about half length of surstylus. Phallapodema straight.

Material examined. BRAZIL. Paraná: 1 ♂, Palmas, PGWR, A.C. Pereira col., *Af*, 20.xii.2012 (DZUP); Telêmaco Borba, Res. Biol. Samuel Klabin, 02.xi.1987, Lev. Ent. PROFAUPAR (DZUP).

Distribution. Brazil: Rio de Janeiro, Paraná and Santa Catarina; Paraguay (Bortolanza et al. 2006).

***Coenosopsia ferrari* Nihei & de Carvalho, 2004**
Figure 7

Coenosopsia ferrari Nihei and de Carvalho, 2004: 262. Type locality: Brazil, Distrito Federal, Brasília, Reserva Ecológica do Instituto de Geografia e Estatística. Bortolanza et al 2006: 40 (key), 14 (phylogeny), 15 (biogeography).

Diagnosis. Palpus, proboscis and antenna brown. Tergites 1 and 2 yellow. Tergites 3, 4 and 5 dark brown. Cercus and surstylus long and curved, both longer than wide, with similar length. Phallapodema curved.

Material examined. BRAZIL. Paraná: 2 ♂, Palmas, PGWR, A.C. Pereira col., *Ar*, 20.xii.2012 (DZUP); same locality and collector: 1 ♂ and 19 ♀, *Af*, 26.vii.2014; 1 ♀, *Ae*, 8.vii.2014; 13 ♂ and 3 ♀, *Ar*, 5.iii.2013 (LabDip); 1 ♂ and 2 ♀, *Af*, 1.ix.2014 (LabDip); 2 ♂, *Ar*, 2.v.2013 (LabDip); 5 ♂ and 2 ♀, *Ag*, 5.vii.2014 (LabDip); 3 ♂, *Ar*, 5.iii.2013 (LabDip); 5 ♂, *Ar*, 5.iv.2013 (LabDip); 1 ♀, *Ae*, 5.vii.2014 (LabDip); 1 ♂, *Ar*, 5.xii.2012 (LabDip); 1 ♂, *Ar*, 6.ii.2013 (LabDip); 1 ♀, *Ar*, 6.ix.2012 (DZUP); 3 ♂, *Ar*, 10.i.2013 (DZUP); 1 ♂, *Ar*, 10.ix.2013 (DZUP); 2 ♀, *Ae*, 10.vi.2014 (LabDip); 1 ♂ and 1 ♀, *Ar*, 10.vii.2013 (DZUP); 8 ♀, *Af*, 12.vii.2014 (LabDip); 2 ♂, *Ar*, 12.ii.2013 (LabDip); 1 ♀, *Ae*, 12.v.2014 (LabDip); 1 ♀, *Ae*, 14.iii.2014 (LabDip); 1 ♀, *Ae*, 15.ix.2014 (LabDip); 1 ♂, *Ag*, 16.i.2014 (LabDip); 1 ♂, *Ae*, 16.i.2014 (LabDip); 3 ♂, *Ar*, 16.v.2013 (LabDip); 2 ♂ and 2 ♀, *Ar*, 16.v.2013 (LabDip); 1 ♀, *Af*, 19.v.2014 (LabDip); 1 ♀, *Ae*, 19.viii.2014 (LabDip); 1 ♂ and 4 ♀, *Af*, 19.viii.2014 (LabDip); 1 ♂, *Ar*, 19.x.2012 (LabDip); 10 ♂, *Ar*, 2.v.2013 (LabDip); 10 ♂, *Ar*, 21.ii.2013 (LabDip); 1 ♀, *Ae*, 21.iii.2014 (LabDip); 4 ♂, *Ar*, 21.ix.2012 (LabDip); 5 ♂, *Ar*, 22.iii.2013 (LabDip); 1 ♂, *Ar*, 23.i.2014 (LabDip); 1 ♂, *Ar*, 23.ix.2013 (LabDip); 9 ♂, *Ar*, 24.i.2013 (LabDip); 2 ♂, *Ar*, 25.vii.2013 (LabDip); 1 ♀, *Ae*, 26.v.2014 (LabDip); 4 ♀, *Af*, 26.viii.2014 (LabDip); 1 ♂, *Ag*, 28.ii.2014 (LabDip); 1 ♀, *Ae*, 28.iii.2014 (LabDip); 1 ♂, *Ar*, 29.v.2013 (LabDip); 3 ♂ and 1 ♀, *Ar*, 29.v.2013 (LabDip); 1 ♂, *Af*, 29.vii.2014 (LabDip); 1 ♀, *Af*, 29.vii.2014 (LabDip); 2 ♂ and 2 ♀, *Ar*, 5.iv.2013 (LabDip); 1 ♂ and 27 ♀, *Ae*, 5.viii.2014 (LabDip); 2 ♂, *Ar*, 6.ii.2013 (LabDip); 4 ♀, *Ar*, 6.ii.2013 (LabDip); 1 ♂ and 1 ♀, *Af*, 7.ii.2014 (LabDip); 2 ♀, *Af*, 9.ix.2014 (LabDip); 1 ♂, Brasília, Distrito Federal, 13.v.1997, I. R. Diniz (Paratype) (DZUP).

Distribution. Brazil (Distrito Federal) (Nihei and de Carvalho 2004)

New record. Paraná (Palmas).

Delia Robineau-Desvoidy, 1830

***Delia* sp.**

Diagnosis. Similar to *D. platura* (Meigen, 1826), but it differs in leg ciliation and genitalia.The current taxonomy of *Delia* do not allow for a precise identification of this morphospecies.

Material examined. BRAZIL. Paraná: 1 ♂, Palmas, PGWR, A.C. Pereira col., *Ag*, 9.xii.2014 (LabDip); same locality and collector: 1 ♀, *Ag*, 8.vii.2014; 12 ♂ and 10 ♀, *Ar*, 6.x.2012; 2 ♀, *Ar*, 2.xi.2014; 1 ♂ and 1 ♀, *Ar*, 19.x.2012; 1 ♂, *Af*, 26.viii.2014; 1 ♂, *Ar*, 6.x.2012; 1 ♂, *Ag*, 5.vii.2014 (LabDip); 2 ♂ and 5 ♀, *Ar*, 1.xi.2012; 1 ♀, *Ag*, 4.xi.2014 (LabDip); 1 ♂, *Ar*, 6.x.2012 (DZUP); 1 ♀, *Ar*, 7.x.2013 (DZUP); 1 ♂, *Ag*, 9.ix.2014 (DZUP); 2 ♂ and 1 ♀, *Ar*, 9.viii.2013 (LabDip); 1 ♂, *Ar*, 10.i.2013 (DZUP); 1 ♀, *Ag*, 10.vi.2014 (DZUP); 3 ♂ and 2 ♀, *Ar*, 10.vii.2013 (LabDip); 1 ♀, *Ar*, 10.vii.2014 (LabDip); 1 ♀, *Ar*, 11.xi.2014 (LabDip); 1 ♂, *Ar*, 16.xi.2012 (LabDip); 3 ♂ and 2 ♀, *Ar*, 16.xi.2012 (LabDip); 7 ♂, *Ar*, 21.ix.2012 (LabDip); 1 ♀, *Ar*, 24.i.2013 (LabDip); 1 ♂ and 3 ♀, *Ar*, 25.vii.2013 (LabDip); 1 ♂, *Ar*, 29.x.2014 (LabDip); 1 ♀, *Ar*, 6.ii.2013 (LabDip); 4 ♂ and 4 ♀, *Ag*, 9.xii.2013 (LabDip); 1 ♂, *Ag*, 9.xii.2014 (LabDip).

Biology. The larvae of *Delia* species are polyphagous, and some species cause important crop losses (Gouingauen and Städler 2006).

Distribution. It is a cosmopolitan genus found in all biogeographic regions (Griffiths 1993).

Emmesomyia Malloch, 1917

***Emmesomyia auricollis* (Stein, 1918)**
Figure 9

Taeniomyia auricollis Stein 1918: 237. Type locality: Brazil, Rio Grande do Sul, Teresópolis. Pont 1974:9 (catalogue), Albuquerque and Couri 1979: 496 (catalogue, redescription).

Diagnosis. Antenna yellow. Palpus basally light brown and apically yellow. Flagellomere not enlarged. Thorax yellow with sparse gray pruinosity, presenting dorsally a dark brown transverse stripe in the medial third. Dorsocentral setae 2+3. Katepisternal setae 1+2. Suprasquamal ridge ciliated. Scutellum dark brown. Vein *dm-cu* slightly curved.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 6.xi.2013 (LabDip); 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 21.xi.2013 (LabDip); 1 ♂ Telêmaco Borba, Reserva Biológica Samuel Klabin, 3.xi.1986 (PROFAUPAR) (DZUP); same locality and collector: 1 ♂, 29.xi.1986; 1 ♀, 1.xii.1986; 1 ♀, 15.xii.1986; 17.viii.1987; 2 ♀, 24.viii.1987; 1 ♂ and 1 ♀, 7.ix.1987; 2 ♀, 21.ix.1987; 1 ♀, 28.ix.1987; 1 ♀, 5.x.1987; 1 ♂ and 1 ♀, 12.x.1987; 1 ♀, 19.x.1987; 1 ♀, 2.xi.1987; 1 ♂, 16.xi.1987; 1 ♀, 21.iii.1988; 2 ♂, São José dos Pinhais, Br 277, Km 54, 30.vii–5.viii.1984 (C.I.I.F.) (DZUP); same locality and collector: 1 ♂, 16.x.1984; 1 ♂, 14.i.1985; 1 ♂, 21.i.1985; 1 ♀, 22.i.1985; 1 ♀, 8.iii.1985; 1 ♂, 13.iii.1985; 1 ♀, 4.x.1986; 1 ♀, 3.xi.1986; 1 ♂, 24.xi.1986; 1 ♀, Guarapuava, Estância Águas Santa Clara, 1.ix.1986 (PROFAUPAR) (DZUP); same locality and collector: 1 ♂, 8.ix.1986; 1 ♀, 15.ix.1986; 1 ♀, 10.xi.1986; 1 ♀, 15.xii.1986; 1 ♀, 22.xii.1986; 1 ♀, Ponta Grossa, Vila Velha, IAPAR, 8.v.2000, Ganho and Marinoni col. (DZUP); 6 ♂ and 2 ♀, Ponta Grossa, 2–23.xi.2003, Melo, G. A. R. (DZUP); same locality and collector: 6 ♂ and 2 ♀,23.xi-14.xii.2003 (DZUP). Santa Catarina: 1 ♀, Nova Teutônia, vii.1963, Fritz Plaumann, col. (MZUSP); same locality and collector: 2 ♂, ix.1967; 1 ♀, ii.1967; 1 ♂ and 1 ♀, v.1970; 8 ♂ and 1 ♀, x.1970; 14 ♂ and 1 ♀, xi.1970; 1 ♀, ii.1971; 1 ♀, iv.1971; 1 ♀, v.1971; 1 ♀, xi.1971 (MZUSP); São Paulo: 1 ♂, Cantareira, Chapadão xi. 1945, M. Carreira (MNRJ); Rio de Janeiro: 1 ♂, Petropolis, RJ, Alto Mosella, 1100m, 5.xi.1956, D. Albuquerque (MNRJ); 1 ♂, Angra dos Reis, 1936, Trav. and Lopes (MNRJ); 1 ♀, Nova Friburgo, 1–31.i.1965, Gred and Guimarães (MNRJ).

Distribution. Brazil (Rio de Janeiro, São Paulo and Santa Catarina) (Albuquerque and Couri 1979).

Biology. The females of this species have a strong spine on the ovipositor, a characteristic found in dipteran leaf miners (Albuquerque and Couri 1981).

New record. Paraná (Guarapuava, Palmas, Ponta Grossa, São José dos Pinhais, Telêmaco Borba).

***Emmesomyia sobria* (Albuquerque & Couri, 1981)**
Figure 10

Anthojuba sobria Albuquerque and Couri 1981: 157. Type locality: Brazil, Santa Catarina, Nova Teutônia. Pamplona 1992: 571 (figure, head).

Diagnosis. Antenna yellow. Palpus basally light brown and apically yellow. Flagellomere very enlarged. Thorax yellow with areas of gray pruinosity, presenting dorsally a brown stripe reaching scutellum. Dorsocentral setae 2+3, the presutural first one with half length of the second one. Katepisternal setae 1+1+1. Suprasquamal ridge bare. Vein *dm-cu* straight.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 5.iii.2013 (LabDip); 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 29.v.2013 (LabDip); 1 ♂, Ponta Grossa, Vila Velha, Reserva IAPAR, BR 376, 18.viii.1986 (PROFAUPAR) (DZUP); same locality and collector: 1 ♀, 25.viii.1986; 1 ♀, 10.xi.1986; 2 ♀, 22.xii.1986; 1 ♀, 10.xi.1986; 1 ♂, 10.vii.2000; 1 ♀, Guarapuava, Estância Águas Santa Clara, 04.viii.1986 (PROFAUPAR) (DZUP); same locality and collector: 1 ♀, 25.viii.1986; 1 ♀, 15.ix.1986; 1 ♂, Telêmaco Borba, Reserva Biológica Samuel Klabin, 24.xi.1986 (Entomological surveying PROFAUPAR) (DZUP); same locality and collector: 1 ♀, 08.xii.1986; 1 ♀, 15.xii.1986; 1 ♀, 17.viii.1987; 1 ♀, 14.ix.1987; 1 ♂, São José dos Pinhais, Serra do Mar, BR 277, km 54, 20.x.1986 (PROFAUPAR) (DZUP); same locality and collector: 1 ♂, 24.xi.1986 (DZUP).

Distribution. Brazil (Santa Catarina) (Albuquerque and Couri, 1981).

Biology. The behavior of *Emmesomyia* is not well known, species are most likely coprophages in the larval stage, some Oriental species are larviparous (Ackland 1995).

New record. Paraná (Guarapuava, Palmas, Ponta Grossa, São José dos Pinhais, Telêmaco Borba)

Leucophora Robineau-Desvoidy, 1830

***Leucophora maculipennis* (Albuquerque, 1953)**
Figure 11

Hammomyia maculipennis Albuquerque 1953: 535. Type locality: Brazil, São Paulo, Itaquaquecetuba. Pont 1974: 7 (catalogue).

Diagnosis. Ground-color dark brown, with areas of gray pruinosity. Antenna, palpus and proboscis brown. Antenna short, flagellomere twice as long as pedicel. Parafacialia and gena enlarged, longer than flagellomere length. Dorsocentral setae 2+3. Prealar seta absent. Vein *dm-cu* slightly curved. Vein A_1+CuA_2 reaching the wing margin. Wing brownish with spots on vein *r-m* and vein *dm-cu*.

Material examined. BRAZIL. Paraná: 2 ♂ and 1 ♀, Palmas, PGWR, A.C. Pereira col., *Ar*, 5.xii.2012 (DZUP); same locality and collector: 3 ♂, *Ar*, 3.xii.2013 (DZUP); 17 ♂, *Ar*, 6.ix.2012 (LabDip); 1 ♂, *Ar*, 6.xii.2012 (LabDip); 25 ♂ and 4 ♀, *Ar*, 20.xii.2012 (LabDip); 14 ♂,*Ar*,

7.x.2013 (LabDip); 1 ♂, *Ar*, 1.xi.2012 (LabDip); 5 ♂, *Ar*, 10.i.2013 (LabDip); 6 ♂, *Ar*, 10.ix.2013 (LabDip); 1 ♂, *Af*, 11.xi.2014 (LabDip); 3 ♂, *Ar*, 16.xi.2012 (LabDip); 1 ♂, *Ar*, 18.iv.2013 (LabDip); 1 ♂ and 1 ♀, *Ar*, 19.x.2012 (LabDip); 6 ♂ and 1 ♀, *Ar*, 19.xi.2013 (LabDip); 3 ♂, *Ar*, 2.xi.2012 (LabDip); 2 ♂, *Ar*, 21.ii.2013 (LabDip); 2 ♂ and 1 ♀, *Ar*, 21.ix.2012 (LabDip); 13 ♂ and 1 ♀, *Ar*, 21.xi.2013 (LabDip); 13 ♂, *Ar*, 23.ix.2013 (LabDip); 11 ♂ and 1 ♀, *Ar*, 24.i.2013 (LabDip); 1 ♂, *Ar*, 25.xi.2014 (LabDip); 2 ♀, *Ar*, 29.x.2014 (LabDip); 1 ♂, *Ar*, 5.iii.2013 (LabDip); 5 ♂ and 1 ♀, *Ar*, 6.ii.2013 (LabDip); 4 ♂ and 2 ♀, *Ar*, 6.xi.2013 (LabDip); 2 ♀, *Ar*, 9.xii.2014 (LabDip); 1 ♂, *Ar*, 5.iii.2013; 6 ♂ and 1 ♀, *Ar*, 19.xi.2013; 1 ♂, *Ar*, 1.xi.2012; 3 ♂, *Ar*, 2.xi.2012; 1 ♂, *Ar*, 25.xi.2014; 1 ♂, *Ar*, 11.xi.2014; 2 ♂, *Ar*, 6.x.2012 (LabDip); São José dos Pinhais, 1 ♂, Serra do Mar, BR 277, km 54, 1–8.X.1984 (C.I.I.F) (DZUP); 1 ♂, same place, 5.x.1986 (PROFAUPAR) (DZUP); 1 ♀, same locality and collector, 31.x.1986 (DZUP); 1 ♂, same locality and collector, 4.xi.1986 (DZUP); Guarapuava, 3 ♂ Estância Águas Santa Clara, 3.ix.1986 (PROFAUPAR) (DZUP); 1 ♂ same locality and collector, 3.xi.1986 (DZUP); Santa Catarina: Nova Teutônia, 1 ♀, viii.1967, Fritz Plaumann col. (MZUSP); 1 ♀ same locality and collector, xi.1967 (MZUSP).

Distribution. Brazil (Rio de Janeiro and São Paulo) (Albuquerque 1953).

Biology. Specimens from Santa Catarina (Nova Teutônia) were collected at 300–500 m a.s.l. The specimen from Rio de Janeiro was collected at 1000 m a.s.l. (Albuquerque 1953).

New record. Paraná (Guarapuava, Palmas, São José dos Pinhais) and Santa Catarina (Nova Teutônia).

Pegomya Robineau-Desvoidy, 1830

***Pegomya bruchi* (Shennon & Del Pont, 1926)**
Figure 12

Hylemyia bruchi Shennon and Del Pont 1926: 25. Type locality: Argentina, Buenos Aires Province. Albuquerque 1959: 42 (key).

Diagnosis. Ground-color light brown, with areas of gray pruinosity . Legs light brown. Dorsocentral setae 2+3. Prealar seta strong, longer than anterior notopleural seta. Katepisternal setae 2+2. Vein *dm-cu* slightly curved. Vein A_1+CuA_2 reaching the wing margin. Wing with spots on vein R_1 apex and reaching the vein *Sc* apex, between vein R_{4+5} and vein *M* base, vein *r-m*, vein *dm-cu*, 2 on vein *dm-cu* corners and an inconspicuous spot on vein R_{2+3} apex.

Material examined. BRAZIL. Paraná: 1 ♂, Palmas, PGWR, A.C. Pereira col., *Ar*, 7.x.2013; 1 ♀, *Ar*, 05.xii.2012 (LabDip); 2 ♂ and 1 ♀, Curitiba, 28.v.1981, M. Brito; 1 ♀, Curitiba, 17.i.1983, M.L. Pilloto and A. Carine (DZUP); 3 ♀, Curitiba, 18.i.1984, M. Pilloto and A.C. Saad (DZUP); 1 ♀, Curitiba, ix.1998, Pegoraro (DZUP).

Distribution. Argentina (Malloch 1934), Brazil (Rio de Janeiro) (Albuquerque 1959)

Biology. According to label information, some specimens from Curitiba were collected over rotting onions.

New records. Paraná (Curitiba, Palmas).

***Pegomya poeciloptera* Malloch, 1921**
Figure 13

Pegomya poeciloptera Malloch 1921: 430. Type locality: Argentina, La Plata. Pont 1974: 8 (catalogue).

Diagnosis. General coloration light brown, with areas of gray pruinosity. Legs light brown. Dorsocentral setae 2+3. Prealar seta short, half as long as anterior notopleural seta. Katepisternal setae 1+2. Vein *dm-cu* straight. Vein A_1+CuA_2 reaching the wing margin. Wing with spots on vein *h*, vein R_1 apex, vein R_{2+3} apex, vein R_{4+5} apex, vein *M* apex, vein *r-m*, vein *dm-cu* and a spot between vein R_{4+5} and vein CuA_1 base.

Material examined. BRAZIL. Paraná: 1 ♀, Palmas, PGWR, A.C. Pereira col., *Af*, 6.x.2012 (DZUP); same locality and collector: 1 ♀, *Af*, 15.ix.2014; 1 ♀, *Ag*, 15.ix.2014; 2 ♀, *Af*, 26.viii.2014 (DZUP); 1 ♂, *Ag*, 5.vii.2014 (LabDip); 1 ♀, *Ar*, 6.x.2012 (LabDip); 4 ♀, *Ar*, 21.ix.2012 (DZUP); 1 ♀, *Ag*, 22.ix.2014 (LabDip); 1 ♀, *Ag*, 29.x.2014 (LabDip); 1 ♂, Telêmaco Borba, Res. Biol. Samuel Klabin, 31.viii.1987, Lev. PROFAUPAR (DZUP); Rio Grande do Sul: 1 ♂, Morro Redondo, Santo Amor, 26.vii.2002, R. F. Krüger (DZUP); 1 ♂ and 2 ♀, Arroio Grande, Mauá, 23.viii.2002, P. B. Ribeiro; same locality and collector: 1 ♀, 09.viii.2002; 2 ♀, 16.viii.2002; 2 ♀, 30.viii.2002 (DZUP); 2 ♀, Capão do Leão, 30.viii.2002, R. F. Krüger; same locality and collector: 1 ♀, 19.vii.2002; 1 ♀, 19.vii.2002; 6 ♀, 16.viii.2002; 6 ♀, 23.viii.2002; 1 ♀, 04.x.2002 (DZUP); 1 ♀ Pelotas, 16.viii.2002, R. F. Krüger (DZUP).

General distribution. Argentina, Brazil (Santa Catarina) (Albuquerque 1959).

Biology. The species of the genus have leaf miner larvae (Griffiths 1982).

New records. Paraná (Palmas, Telêmaco Borba) and Rio Grande do Sul (Arroio Grande, Capão do Leão, Morro Redondo, Pelotas).

Discussion

This is the first effort to compile data on the distribution of the Anthomyiidae from a southern area in Brazil. It adds a substantial number of records to the states of Paraná (9 new records), where only 7 species were known (Albuquerque 1959, de Carvalho et al. 2002, Bortolanza et al 2006), and some records to Santa Catarina (2 new records) and Rio Grande do Sul (1 new record).

Most records made at the conservation unit pertain to *Anthomyia*: 4 species and 3 morphospecies. Five species

are known to Brazil (de Carvalho and Couri 2018). In the Neotropical Region, *Anthomyia* is the largest genus, with 16 species recorded (Pont 1974, Ackland 2001). *Anthomyia* is divided in 6 sections (*A. cannabina*, *A. mimetica*, *A. monilis*, *A. pluvialis*, *A. punctipennis* and *A. xanthopus*). The species found in southern Brazil belong to the *A. punctipennis* section, which is characterized by wing spots on transversal veins (Griffiths 2001).

In our data, 3 genera were represented by 2 species each: *Coenosopsia*, *Emmesomyia* and *Pegomya*. *Coenosopsia* is a small genus, with 8 species restricted to the New World, from southern North America to southeastern South America. It can be found in tropical and semidecidual forests, and grasslands (Michelsen 1991, Nihei and de Carvalho 2004, Bortolanza et al. 2006). Its species are very similar morphologically and for the most part, they can only be distinguished based on the male terminalia (Nihei and de Carvalho 2004).

The genus *Emmesomyia* has 9 species in the Nearctic Region (Griffiths 1984), 11 in the Palearctic Region and 15 in the Afrotropical Region, but the diversity of other Biogeographical Regions, including the Neotropical Region, is insufficiently known (Ackland 1995). *Emmesomyia* species are probably coprophagous (Ackland 1995).

The genus *Pegomya* is distributed worldwide, with 2 species recorded from Brazil: *P. poeciloptera* and *P. carrerai* Albuquerque, 1959 (Albuquerque 1959). These species can only be differentiated by checking features of the male terminalia. Many species are regarded as phytophagous; the larvae mine the leaves of various plants and in a few cases, they cause damage to commercial crops such as spinach and beets, while other species breed in mushrooms (Huckett 1971).

Other genera—*Calythea*, *Delia* and *Leucophora*—are represented by unique species in our survey. Most of the diversity of *Calythea* can be found in the Afrotropical, Oriental and Palearctic regions and in the Neotropical Region, there are only 2 species (Griffiths 1986). *Delia* is a diverse and unclear group and its species can be found mainly in subalpine and subarctic areas of the Palearctic and Nearctic regions. There are 21 species in the Neotropical Region (Griffiths 1986). The species of *Delia* are polyphagous, and some species are considered important agricultural pests of innumerable plant species of commercial interest. The eggs are deposited near seeds in the germination stage and the larvae feed on cotyledons (Gouinguené and Städler 2006). *Leucophora* includes 10 species from the Neotropics (Pont 1974). Some species are nest parasites of sweat bees (Hymenoptera: Halictidae) (Polidori et al. 2015).

The most abundant species in our samples was *Coenosopsia ferrari* (n = 205). Before this work, this species had only been recored from the Cerrado biome (Nihei and de Carvalho 2004). *Leucophora maculipennis* was the second most abundant species (n = 147), followed by *Delia* sp. (n = 83) and *Anthomyia* sp. 1 (n = 64). Other species were represented by less than 15 specimens (Table 1).

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Authors' Contributions

LRPG and JMF sorted and identified the material and wrote the main text; ACP collected and helped sort the anthomyiid specimens and helped improve the manuscript; MB helped with species' information and improving the manuscript.

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