SHORT COMMUNICATION

First record of *Chrysomya rufifacies* (Macquart) (Diptera, Calliphoridae) from Brazil

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ABSTRACT. First record of *Chrysomya rufifacies* (Macquart) (Diptera, Calliphoridae) from Brazil. In addition to its native fauna, the Neotropical region is known to be inhabited by four introduced species of blow flies of the genus *Chrysomya*. Up until now, only three of these species have been recorded in Brazil – *Chrysomya albiceps* (Wiedemann), *Chrysomya megacephala* (Fabricius), and *Chrysomya putoria* (Wiedemann). In South America, *C. rufifacies* (Macquart) has only been reported from Argentina and Colombia. This study records *C. rufifacies* from Brazil for the first time. The specimens were collected in an area of *cerrado* (savanna-like vegetation) in the municipality of Caxias in state of Maranhão, and were attracted by pig carcasses.

KEYWORDS. Blow fly; *cerrado* biome; exotic species; Northern Brazil; Oestroidea.

RESUMO. Primeiro registro de *Chrysomya rufifacies* (Macquart) (Diptera, Calliphoridae) para o Brasil. A região Neotropical compreende além da fauna nativa, quatro espécies de moscas varejeiras exóticas do gênero *Chrysomya*. No Brasil, até o momento, foram registradas três espécies desse gênero: *Chrysomya albiceps* (Wiedemann), *Chrysomya megacephala* (Fabricius), e *Chrysomya putoria* (Wiedemann). *C. rufifacies* (Macquart), na América do Sul, foi registrada somente para a Argentina e Colômbia. Neste estudo, *C. rufifacies* é registrada pela primeira vez para o Brasil. Os espécimes foram coletados em uma região de cerrado, no município de Caxias, estado do Maranhão, atraídos por carcaças de porcos.

PALAVRAS-CHAVE. Espécie exótica; Oestroidea; região de cerrado; região Nordeste; varejeira.

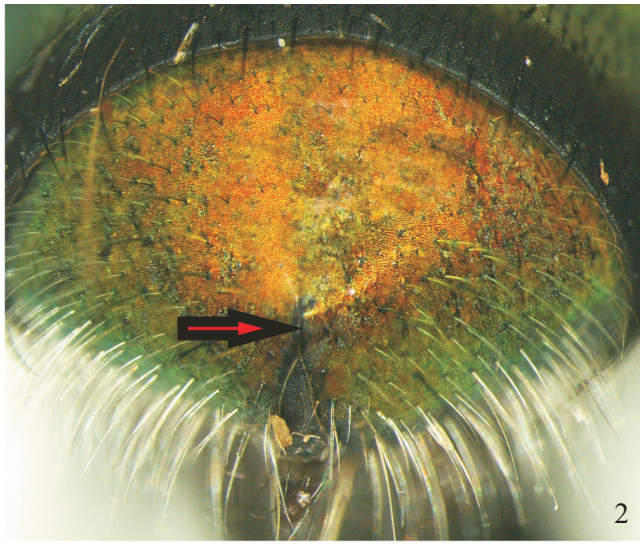
Calliphorids or blow flies is a cosmopolitan group of calyptrate flies comprising nearly 1500 recognized species worldwide (de Carvalho & Mello-Patiu 2008). The family is poorly represented in the Neotropical region, with only about 130 records (de Carvalho & Mello-Patiu 2008), 36 of which are from Brazil (Mello 2003). In addition to the native species, the Neotropical fauna includes species that have been introduced from the Old World, including some species of the genus *Chrysomya* Robineau-Desvoidy, 1830 and the subfamily Polleniinae (Pape *et al.* 2004; Whitworth 2010).

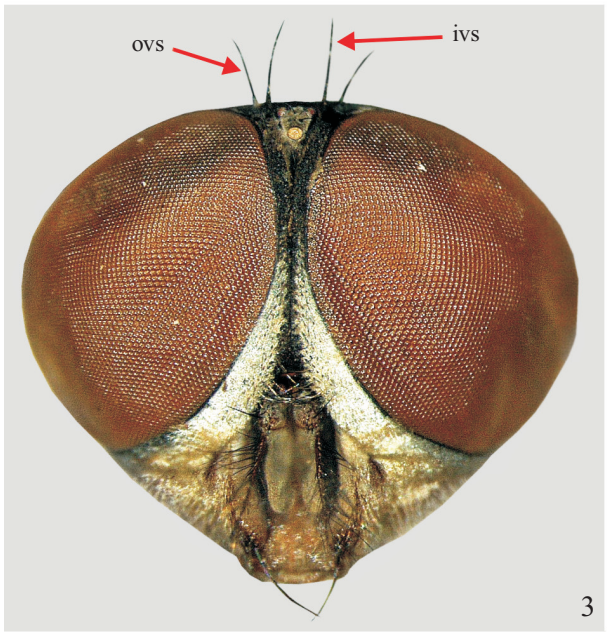
Chrysomya contains some 12 recognized species restricted primarily to the Old World tropics and subtropics, where they are one of most abundant and economically important genera of calliphorids (Guimarães & Papavero 1999). Four species of *Chrysomya* have been introduced involuntary into the Neotropical region over the past three decades (Guimarães & Papavero 1999; Withworth 2010).

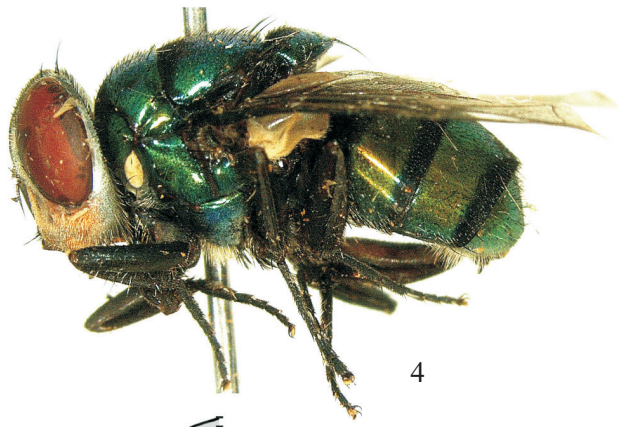
The species *Chrysomya albiceps* (Wiedemann, 1819), *Chrysomya megacephala* (Fabricius, 1794), and *Chrysomya putoria* (Wiedemann, 1818) were recorded for the first time in southern Brazil in 1978 (Guimarães *et al.* 1978), and since then, they have become widespread in South America. These species appear to have been introduced into Brazil during the immigration of Angolan refugees, who arrived by ship accompanied by their domestic animals (Guimarães *et al.* 1978, 1979).

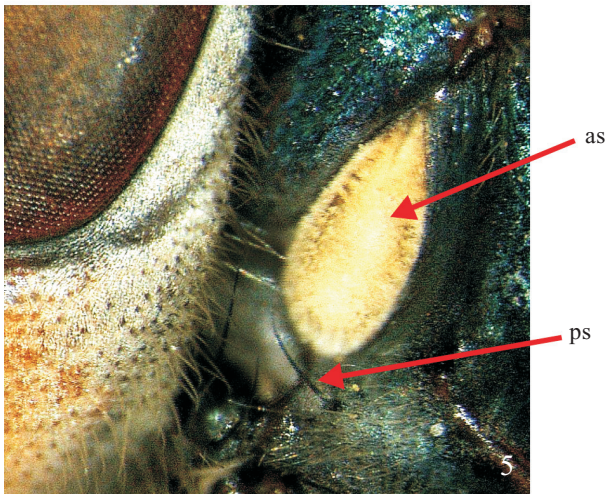
Chrysomya rufifacies (Macquart, 1843) is native to the Australasian and Pacific regions and was first recorded in the Neotropics in 1978, when larvae were collected from a human cadaver in Costa Rica (Jirón 1979). This species spread rapidly across North America (Baumgartner 1993; Rosati & VanLaerhoven 2007). *Chrysomya rufifacies* was recorded from South America (Argentina) for the first time in 1989 (Mariluis & Schnack 1989). The species was subsequently recorded from Colombia, in 2002 (Barreto *et al.* 2002). In a study of Colombian chrysomyines and toxotarsines, Amat (2009) analyzed many blowfly specimens from a wide range of localities, but encountered no *C. rufifacies*. Pape *et al.* (2004) have recorded this species from two localities in Colombia, however. In the present study, we record *C. rufifacies* from Brazil for the first time.

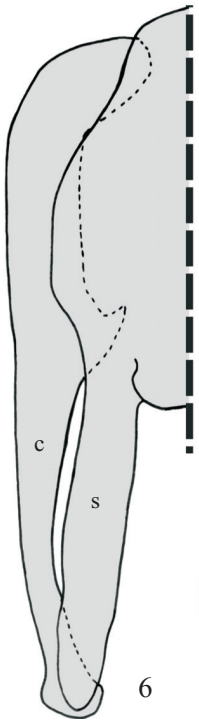
The specimens analyzed in this study were collected in the Inhamum Ecological Reserve (04º53'56"S; 43º26'10"W)

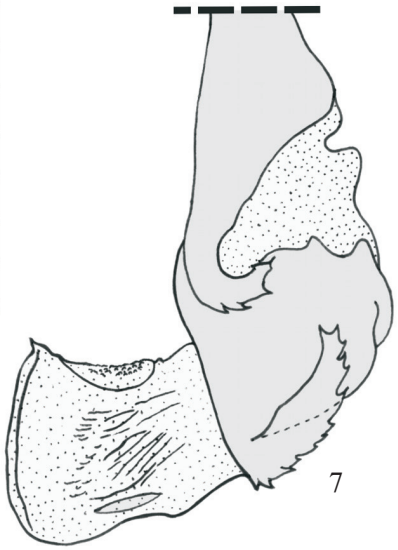












Figs. 1–7. 1, suspended trap on cage with pig; 2–5. *Chrysomya rufifacies*. 2, female fifth tergite with a cleft in the posterior margin, dorsal view; 3, male head, frontal view: vertical setae; frons twice the diameter of the anterior ocellus at its narrowest point; 4, female habitus, lateral view; 5, proepisternal seta, lateral view of thorax; 6, cercus and surstylus, lateral view; 7, distiphallus, lateral view. as = anterior spiracle; c = cercus; ivs = inner vertical seta; ovs = outer vertical seta; ps = proepisternal seta; s = surstylus.

in the municipality of Caxias, state of Maranhão, northern Brazil. The reserve covers 3.564 ha and is composed of *cerrado* savanna and gallery forests.

The specimens were collected in suspended traps placed on metal cages (Fig. 1) containing a pig carcass weighing 12 Kg in July, 2010 (dry season) and March and April, 2011 (rainy season). Were utilized three cages spaced 600m apart.

Blowfly specimens were removed from the traps daily (at 24 hour intervals), preserved in 70% alcohol in the field and then mounted on pins. Voucher specimens were deposited in the entomological collection of the Goeldi Museum (MPEG) in Belém, in the Brazilian state of Pará, and in the Maranhão zoological collection (CZMA) at the Universidade Estadual do Maranhão (UEMA) in Caxias. Sixty-eight specimens (8 males and 60 females) were deposited in the MPEG and 95 (16 males and 79 females) in the CZMA.

The male abdomens were removed and bleached unheated in 70% KOH for 24 hours, and then transferred to glycerin for further dissection and examination. Bleached abdomens and genitalia were stored in microvials with glycerin and pinned beneath the respective source specimen. The specimens were drawn using a camera lucida. Morphological terminology follows Withworth (2010).

The specimens identified as *C. rufifacies* have strong proepisternal setae, vertical outer setae in the males, frons in the males twice diameter of the anterior ocellus at its narrowest point, and posterior margin of T5 with a cleft dorsally in the females (Figs. 2, 3, 4, 5). Because of the proepisternal seta, the specimens were assigned to *C. putoria* in the most recent key published for the most common forensic South American dipteran species (de Carvalho & Mello-Patiu 2008), which cites only three species of *Chrysomya*: *C. albiceps*, *C. megacephala*, and *C. putoria*. However, when we utilized keys which include the four introduced species of *Chrysomya* (Guimarães & Papavero 1999; Amat *et al.* 2008; Amat 2009; Withworth 2010), the specimens corresponded to *C. rufifacies*.

Chrysomya putoria and *C. rufifacies* are the only Neotropical species of *Chrysomya* with white anterior thoracic spiracles that have proepisternal setae. However, these two species are easily differentiated by external morphological characters and the shape of the male terminalia. We mounted and analyzed the terminalia of specimens collected in Pará and Amazonas in the Brazilian Amazon basin, which we identified as *C. putoria*, based on the similarities with the terminalia described for this species (Guimarães *et al.* 1978). The terminalia of the specimens collected in the present study in Maranhão are different from those of *C. putoria*, but are consistent with the structures observed in *C. rufifacies* (Figs. 6, 7).

The terminalia of *C. albiceps* are similar to those of *C. rufifacies*, and these species are differentiated only by the presence of a proepisternal seta in *C. rufifacies*. Because of the similarities of the male terminalia, *C. albiceps* and *C. rufifacies* have been considered to be the same species (Baumgartner 1993). However, detailed morphological studies of the larvae (Tantawi & Greenberg 1993) and molecular genetics (Wells & Sperling 1999) have confirmed that they are different species. As the specimens analyzed in this study present a proepisternal seta – the principal morphological trait distinguishing the species (Dear 1985; Guimarães & Papavero 1999; Amat *et al.* 2008; Amat 2009; Withworth 2010) – they were identified as *C. rufifacies* and not as *C. albiceps*, given the lack of a clear difference in the male terminalia.

Key to the Neotropical species of *Chrysomya*

The key presented here was based on the examination of specimens deposited in the MPEG and additional information available in the literature (Dear 1985; Guimarães & Papavero 1999; Amat *et al.* 2008; Amat 2009; Withworth 2010).

1. Anterior thoracic spiracle dark or blackish-brown. Male eyes with upper facets much enlarged and with sharp demarcation from the smaller lower facets..*C. megacephala*

1'. Anterior thoracic spiracle pale (Fig. 4, 5). Eye of male with no clear line of demarcation between larger and smaller facets 2

2. Proepisternal seta absent ..... *C. albiceps*

2'. Proepisternal seta present (Fig. 5) 3

3. Male frons less than the diameter of the anterior ocellus at its narrowest point. Outer vertical setae usually absent in males. Tergite 5 of the female with no dorsal cleft in the posterior margin ..... *C. putoria*

3'. Male frons twice the diameter of the anterior ocellus at its narrowest point (Fig. 3). Outer vertical setae present in the males (Fig. 3). Tergite 5 of the female with a dorsal cleft in the posterior margin (Fig. 2) ..... *C. rufifacies*

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