Research Note

Rev. Bras. Parasitol. Vet., Jaboticabal, v. 21, n. 4, p. 412-414, out.-dez. 2012
ISSN 0103-846X (impresso) / ISSN 1984-2961 (eletrônico)

New records of Muscidae (Diptera) in Campo Grande, MS, Brazil

Novos registros de dípteros muscóides em Campo Grande, MS, Brasil

Hera Luana Luiz[2]; Tiago Ledesma Taira[3]; Wilson Werner Koller[1]*

[1]Laboratório de Ectoparasitologia, Área de Sanidade Animal, Embrapa Gado de Corte, Campo Grande, MS, Brasil

[2]Curso de Ciências Biológicas, Universidade Federal de Mato Grosso do Sul – UFMS, Campo Grande, MS, Brasil

[3]Curso de Agronomia, Universidade Estadual de Mato Grosso do Sul – UEMS, Aquidauana, MS, Brasil

Received July 17, 2011
Accepted December 19, 2011

Abstract

Synanthropic flies outstanding beside other flies due their relative abundance close to domestic animals and human population, to which they are able to cause myiasis or transmit pathogenic agents. As they're necrophagous they act as corpse decomposers and are useful in the forensic entomology in the *post mortem interval* determination. This study aimed to know flies diversity and abundance in Campo Grande, State of Mato Grosso do Sul. Captures were made weekly, utilizing three traps baited with decaying fish meat, from June of 2008 to May of 2009 in a remainder ciliary forest of the Embrapa's Cattle Beef Experimental Farm. The dipterans families that were considered and respectively number of collected specimens were: Calliphoridae (105,334); Muscidae (27,999); Sarcophagidae (21,083); Fanniidae (17,759) and Mesembrinellidae (305), totalizing 172,480 dipterous. To the local known species some Muscidae were increased as follows: *Neomuscina atincticosta*, *Pseudoptilolepis elbida*, *Polietina orbitalis*, *Polietina flavithorax*, *Scutellomusca scutellaris*, *Graphomya analis* and *Morellia couriae*.

Keywords: Calliphoridae, fish bait, Muscidae, relative abundance.

Resumo

As moscas sinantrópicas se destacam pelo fato de serem relativamente abundantes junto à população humana e animais domésticos, podendo causar a estes miíases ou transmitir agentes patogênicos. Por serem necrófagas, atuam na decomposição de cadáveres e são úteis para a entomologia forense como indicadores na determinação do *intervalo post mortem* – IPM. Este trabalho visou conhecer a diversidade e a abundância das espécies em Campo Grande, Estado de Mato Grosso do Sul. As capturas foram realizadas semanalmente, com três armadilhas, utilizando isca de peixe deteriorado, durante o período de junho de 2008 a maio de 2009 em mata ciliar remanescente na fazenda experimental da Embrapa Gado de Corte. Foram consideradas as seguintes famílias de dípteros, seguidas pelo número de exemplares obtidos: Calliphoridae (105.334); Muscidae (27.999); Sarcophagidae (21.083); Fanniidae (17.759) e Mesembrinellidae (305), totalizando 172.480 dípteros. Foram acrescentadas às espécies de Muscidae já notificadas para o local deste estudo: *Neomuscina atincticosta*, *Pseudoptilolepis elbida*, *Polietina orbitalis*, *Polietina flavithorax*, *Scutellomusca scutellaris*, *Graphomya analis* e *Morellia couriae*.

Palavras-chave: Calliphoridae, isca de peixe, Muscidae, abundância relativa.

The flies that belong to the Calliphoridae, Mesembrinellidae, Muscidae, Sarcophagidae, and Fanniidae families are mostly associated with decaying meat and/or corpses (D'ALMEIDA; ALMEIDA, 1998; CARVALHO; MELLO-PATIU, 2009). Several species can also develop in vegetable organic matter. Besides its usefulness as a decaying matter decompositor, these flies have great importance as pollinators (FAEGRI; VAN DER PIJL, 1979). They also can cause economic damage when responsible for primary myiasis (*Cochliomyia hominivorax*) or secondary myiasis (GUIMARÃES; PAPAVERO, 1999). Especially in cattle, an annual loss in meat and milk production estimated at US$ 150 million has been suggested by Grisi et al. (2002), only due *C. hominivorax* action. By visiting these different food sources, including garbage and sewage, they pose a risk to human and livestock health, due to their ability to convey pathogens (VON ZUBEN et al., 1996).

The most common species on cadavers, because they have their biology well studied, were used as indicators in forensic entomology

*Corresponding author: Wilson Werner Koller
Embrapa Gado de Corte, Av. Rádio Maia, 830,
CEP 79106-550, Campo Grande, MS, Brasil
e-mail: wilson.koller@embrapa.br

to determine postmortem interval – PMI (SALVIANO et al., 1996; ANDRADE et al., 2005). Besides synanthropic flies, because of their abundance, proximity to man, health, and economic importance, the Calliphoridae and Muscidae families are considered the most interesting (LOPES, 2000).

This study was conducted for a better understanding of local diversity of flies belonging to the families above highlighted. For the catches we used three traps adapted from Ferreira (1978), using as containers for collection two two-liter PET bottles in a system of three funnels of the same type of bottle. The traps were activated for two days a week and catches occurred from June 2008 to May 2009.

The traps were installed in a remnant ciliary forest near the headquarters of the experimental farm of Embrapa Beef Cattle Research Center, 1.2 meters above the floor and about 100 meters distant from each other. Every week, about a third of the bait, 150 grams per trap, was replaced by fish exposed to the environment during 48 hours, with enough water to keep the bait moist during the two days of activation. The fish used is popularly known as "piau-three-spots" – *Leporinus reinhardt* (Anostomidae, Characiformes). The flies catched were killed with ethyl acetate and taken to the Embrapa Beef Cattle Entomology Laboratory – Animal Health Sector –, at which species screening and quantification were performed based on especific keys (CARVALHO; RIBEIRO, 2000; CARVALHO, 2002; SCHUEHLI; CARVALHO, 2005; CARVALHO; MELLO-PATIU, 2009). After that, species to be confirmed and/or identified were sent to the Federal University of Parana, in Curitiba, to the Center for Environmental and Wildlife Studies (CDZOO). The relative abundance of the families here studied, as well as the mentioned species, is showed on Table 1.

In this samples, the Calliphoridae family was represented by the same species previously reported by Gomes et al. (1998), featuring, in descending order, the following total of captured specimens: *Chrysomya albiceps* – 74,843; *Chrysomya megacephala* – 19,975; *Chloroprocta idioidea* – 6966; *Chrysomya putoria* – 1278; *Cochliomyia macellaria* – 1111; *Lucilia eximia* – 909; *Hemilucilia segmentaria* – 176; *Lucilia cuprina* – 60; *Cochliomyia hominivorax* – 14; and *Hemilucilia semidiaphana* – 2. These ten species added for a total of 105,334 flies, accounting for 61.07% of the total capture.

The Muscidae family was represented, including those reported by Gomes et al. (1998) and Koller et al. (2004), by 16 species already determined and two still to be determined, showing the following total of captured specimens: *Atherigona orientalis* – 18,189, *Musca domestica* – 3,073; *Synthesiomyia nudiseta* – 2,777; *Pseudoptilolepis elbida* – 1,037; *Ophyra aenescens* – 914; *Neomuscina atincticosta* – 680; *Parapyrellia maculipennis* – 562; *Biopyrellia bipuncta* – 245; *Morellia nigricosta* – 187; *Ophyra solitaria* – 153; *Polietina flavithorax* – 74; *Morellia humeralis* – 65; *Morellia couriae* – 16; Muscidae sp .1 – 14; Muscidae sp.2 – 5; *Polietina orbitalis* – 5; *Graphomya analis* – 2, and *Scutellomusca scutellaris* – 1. The total number of captured specimens of this family was 27,999, representing 16.23% of the catched flies. Although there were used decaying fish meat in this catches, the authors mentioned above used baits consisted by deteriorated beef liver for Calliphoridae and Muscidae.

Table 1. Species of muscoid dipterans, respective number of specimens and relative abundance, captured weekly with three traps using "rotten fish" in a riparian remaining forest at the Embrapa Beef Cattle Research Center, in Campo Grande, MS, from May 2008 to April 2009.

Family/Species	Number of specimens	Relative abundance (%)
CALLIPHORIDAE	**105.334**	**61.07**
Chrysomya albiceps	74.843	43.37
Chrysomya megacephala	19.975	11.61
Chloroprocta idioidea	6.966	4.04
Chrysomya putoria	1.278	0.74
Cochliomyia macellaria	1.111	0.64
Lucilia eximia	909	0.53
Hemilucilia segmentaria	176	0.10
Lucilia cuprina	60	0.03
Cochliomyia hominivorax	14	0.01
H. semidiaphana	2	0.00
MUSCIDAE	**27.999**	**16.23**
Atherigona orientalis	18.189	10.56
Musca domestica	3.073	1.78
Synthesiomyia nudiseta	2.777	1.61
Pseudoptilolepis elbida	1.037	0.60
Ophyra aenescens	914	0.53
Neomuscina atincticosta	680	0.39
Parapyrellia maculipennis	562	0.32
Biopyrellia bipuncta	245	0.14
Morellia nigricosta	187	0.11
Ophyra solitaria	153	0.09
Polietina flavithorax	74	0.04
Morellia humeralis	65	0.04
Morellia couriae	16	0.01
Muscidae sp.1	14	0.01
Muscidae sp.2	5	0.00
Polietina orbitalis	5	0.00
Graphomya analis	2	0.00
Scutellomusca scutellaris	1	0.00
MESEMBRINELLIDAE	**305**	**0.18**
Mesembrinella peregrina	305	0.18
FANNIIDAE	**17.759**	**10.30**
Fannia spp.	17.759	10.30
SARCOPHAGIDAE	**21.083**	**12.22**
Total	172.480	100.00

(%) Percentage.

Mesembrinellidae was represented only by the species *Mesembrinella peregrina* and occurred in relatively low numbers. It presented a total of 305 flies, only 0.18% of total captured. Fanniidae local species were recently identified by Gomes et al. (2002). Thus, they were here only identified as genus, and counting 17,759 *Fannia* spp. flies that represented 10.3% of the total flies captured. Representatives of Sarcophagidae were identified until family level, resulting in 21,083 individuals, which accounted for 12.22% of the 172,480 flies belonging to the families here considered (Table 1).

It was registered for the first time in Campo Grande, MS, the occurrence of the Muscidae species: *Neomuscina atincticosta*, *Pseudoptilolepis elbida*, *Polietina orbitalis*, *P. flavithorax*, *Scutellomusca scutellaris*, *Graphomya analis*, and *Morellia couriae*.

Concerning the geographical distribution of these species, Carvalho (2002) registered that *N. atincticosta* occurs in Brazil, but it is not specified in wich states of the country. *P. elbida* is referred only to Paraguay (SCHUEHLI; CARVALHO, 2005); *P. orbitalis* occurs in Peru, Bolivia, Brazil, and Argentina; *P. flavithorax* in Peru and Brazil; *S. scutellaris* in Brazil; *G. analis* in Argentina, Chile, Peru, and Brazil; and, finally, *M. couriae* is reported only to Brazil.

References

Andrade HTA, Varela-Freira AA, Batista MJA, Medeiros JF. Calliphoridae (Diptera) coletados em cadáveres humanos no Rio Grande do Norte. *Neotrop Entomol* 2005; 34(5): 855-856. http://dx.doi.org/10.1590/S1519-566X2005000500021

Carvalho CJB. *Muscidae* (*Diptera*) *of the Neotropical Region*: taxonomy. Curitiba: Ed. UFPR; 2002.

Carvalho CJB, Ribeiro PB. Chave de identificação das espécies de Calliphoriadae (Diptera) do Sul do Brasil. *Rev Bras Parasitol Vet* 2000; 9(2): 169-173.

Carvalho CJB, Mello-Patiu C. A. Key to the adults of the most common forensic species of Diptera in South America. *Rev Bras Entomol* 2009; 52(3): 390-406. http://dx.doi.org/10.1590/S0085-56262008000300012

D'Almeida J, Almeida JR. Nichos tróficos em dípteros caliptrados, no Rio de Janeiro, RJ. *Rev Bras Biol* 1998; 58(4): 563-570. PMid:9987210. http://dx.doi.org/10.1590/S0034-71081998000400004

Faegri K, Van Der Pijl L. *The principles of pollination ecology*. Oxford: Pergamon Press; 1979.

Ferreira MJM. Sinantropia de dípteros muscóides de Curitiba, Paraná. I: Calliphoridae. *Rev Bras Biol* 1978; 38(2): 445-454.

Gomes A, Honer MR, Koller WW, Silva RL. Vetores de ovos de *Dermatobia hominis* (L. JR. 1781) (Diptera; Cuterebridae) na região de Cerrados do Mato Grosso do Sul, Brasil. *Rev Bras Parasitol Vet* 1998; 7(1): 37-40.

Gomes PR, Koller WW, Gomes A, Carvalho CJB, Zorzatto JR. Dípteros fanídeos vetores de ovos de *Dermatobia hominis* em Campo Grande, Mato Grosso do Sul. *Pesq Vet Bras* 2002; 22(3): 114-118. http://dx.doi.org/10.1590/S0100-736X2002000300005

Grisi L, Massard CL, Moya Borja GE, Pereira JB. Impacto econômico das principais ectoparasitoses em bovinos no Brasil. *Hora Vet* 2002; 21(125): 8-10.

Guimarães JH, Papavero NA. *Myiasis in man and animals in the Neotropical region; bibliographic database*. São Paulo: Plêiade/FAPESP; 1999.

Koller WW, Gomes PR, Gomes A, Santos STP, Umaki ACS. Dinâmica populacional de Muscidae (Diptera) em mata ciliar remanescente, em Campo Grande, MS, Brasil. *Arq Inst Biol* 2004; 71: 636-639.

Lopes SM. Influência de vários fatores abióticos na atratividade de dípteros muscóides em lixo urbano exposto. *Entomol Vect* 2000; 7(2): 163-189.

Salviano RJB, Mello RP, Santos RFS, Beck LCNH, Ferreira A. Calliphoridae (Diptera) associated with human corpses in Rio de Janeiro, Brazil. *Entomol Vect* 1996; 3(5-6): 145-146.

Schuehli GS, Carvalho CJB. Revision and cladistics of the Neotropical genus *Pseudoptilolepis* Snyder (Diptera, Muscidae). *Rev Bras Zool* 2005; 22(1): 23-34. http://dx.doi.org/10.1590/S0101-81752005000100004

Von Zuben CJ, Bassanezi RC, Reis SF, Godoy WAC, Von Zuben FJ. Theoretical approaches to forensic entomology: I. Mathematical model of postfeeding larval dispersal. *J Appl Entomol* 1996; 120(1-5): 379-382.