

Parasitoids of Diptera collected in traps of different colors from Southern of Goiás State

Parasitóides de Diptera coletados em armadilhas de diferentes cores no Sul do estado de Goiás

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Abstract

The objective of this study was to report parasitoids of Diptera collected in traps of different colors in the south of Goiás state. Twelve traps two as of each color were used, painted yellow, black, red, white, green and blue were used two as of each color. The pupae were obtained by the flotation method. They were individually placed in gelatin capsules until the emergency of the adult flies or their parasitoids. Between March and December 2006, 17 parasitoid specimens were collected from the yellow trap, 15 from the blue trap, 12 from the white trap, 37 from the black trap, one from the green trap and three from the red trap. The parasitoids did not present any preference for any of the trap colors ($F=0.772$; $P=0.58$). The most frequently collected parasitoid species was *Brachymeria podagrica* (Fabricius, 1789) (Hymenoptera: Chalcididae), with 80.0%.

Key words: Dipterous, himenopterous, baits, biocontrol, natural enemy

Resumo

O objetivo desse estudo foi descrever os parasitóides de Diptera coletados em armadilhas de diferentes cores no sul do estado de Goiás. Foram utilizadas 12 armadilhas duas de cada tipo pintadas de amarelo preto, vermelho, branco, verde e azul. As pupas dos dípteros foram isoladas pelo método de flutuação, individualizadas em cápsulas de gelatina até a emergência dos parasitóides. Foram coletados no período de março a dezembro de 2006, 17 exemplares de parasitóides na armadilha amarela, 15 na armadilha azul, 12 na armadilha branca, 37 na armadilha preta, um exemplar na armadilha verde e três na armadilha vermelha. Os parasitóides não apresentaram atração por nenhuma das cores das armadilhas ($F= 0,772$; $P=0,58$). A espécie de parasitóide mais freqüente foi *Brachymeria podagrica* (Fabricius, 1789) (Hymenoptera: Chalcididae) com 80,0%.

Palavras-chave: Dípteros, himenópteros, iscas, controle biológico, inimigo natural

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The Diptera are excellent model for studying synanthropy, not only because their ecological importance, but also, because they act as vectors of pathogenic agents such as cysts of protozoan, helminth eggs, pathogenic enterobacteriae, viruses and fungi (GREENBERG, 1971).

Among the means for controlling flies, chemical insecticides are the most utilized. However, they eventually lose their efficiency as insect populations become resistant to them. Alternative control methods are basically a question of developing awareness, among agricultural producers that it is necessary to take measures such as periodically remove the dung accumulated in the rearing facilities. The viability of using control devices and the advantages of their use in agriculture and animal rearing are indisputable, because of their low cost, ease of handling, selectivity and lack of environmental contamination (SILVEIRA; MADEIRA; AZEREDO-ESPIN, 1989; CARVALHO; MELLO; D'ALMEIDA, 2003).

The objective of this study was to report the parasitoids of Diptera collected in traps of different colors in the south of Goiás state.

This study was conducted within the School of Agronomy of the municipality of Itumbiara (18°25'S – 49°13'W), in the southern Goiás State. Adult dipterous were collected with traps built with metal cans measuring approximately 19 cm of height and 9 cm of diameter, with two horizontal rectangular openings in their lower third, to allow the insects to enter. Nylon funnels that were opened at both ends were attached to the tops of the cans with their bases pointing downwards. The funnels were wrapped in plastic bags to allow the insects to be removed from the traps. Raw bovine liver placed on a layer of dirt, was used as bait to attract dipterous (FERREIRA, 1978). Twelve traps two as of each color were used, painted yellow, black, red, white,

green and blue were used. The traps were hung from eucalyptus trees (*Eucalyptus* sp.) approximately one meter above the ground two meters from each other and 50 meters from the domestic garbage. The adult insects collected were taken to the laboratory, sacrificed using ethyl ether and preserved in 70% alcohol for subsequent identification. To obtain the parasitoids, the contents of the traps were placed in plastic recipients containing a layer of sand to serve as the substrate for pupation of the larvae. Fifteen days after collection in the field, the sand was sieved and the pupae were extracted from it. The pupae were then placed individually in gelatin capsules until the emergence of the dipterous and/or their parasitoids.

The attraction of the specimens and species of parasitoids for the trap colors was analyzed by means of ANOVA, with transformation of the data to $\sqrt{x+0.5}$, and α set at 5%.

Between March and December 2006, 17 parasitoid specimens were collected from the yellow trap, 15 from the blue trap, 12 from the white trap, 37 from the black trap, one from the green trap and three from the red trap (Table 1). The greater absorption of heat by the black trap caused a faster decomposition of the bovine liver, thus attracting a greater number of parasitoids. The parasitoids did not present any preference for any of the trap colors ($F=0.772$; $P=0.58$).

The most frequently collected parasitoid species was *Brachymeria podagrica* (Fabricius, 1789) (Hymenoptera: Chalcididae), with 80.0% (Table 1), which was possibly because of seasonal factors or the search capacity presented by this species. The species *B. podagrica* occurs almost all over the world, parasitizing synanthropic and other Diptera (MARCHIORI et al., 2003).

Table 1. Parasitoids of Diptera collected in traps of different colors in the south of Goiás State from March to December 2006.

Traps color	Species of parasitoids	Frequency
Yellow	<i>Brachymeria podagrica</i>	14
	<i>Brachymeria</i> sp.	03
Blue	<i>Brachymeria podagrica</i>	04
	<i>Brachymeria</i> sp.	11
White	<i>Brachymeria podagrica</i>	10
	<i>Spalangia cameroni</i>	02
Black	<i>Brachymeria podagrica</i>	37
Green	<i>Brachymeria podagrica</i>	01
Red	<i>Brachymeria podagrica</i>	02
	<i>Spalangia endius</i>	01
Total		85

With regard to the attraction of the parasitoid species for trap color, it was found that *Brachymeria* sp. (Hymenoptera: Chalcididae) presented attraction for red; *B. podagrica* presented attraction for yellow, white, black and green; *Spalangia cameroni* Perkins, 1910 (Hymenoptera: Pteromalidae) presented attraction for white; and *Spalangia endius* Walker, 1839 (Hymenoptera: Pteromalidae) presented attraction for red ($F=3.11$; $P=0.05$).

Considering the public health importance of these Diptera as vectors of agents of diseases, surveying of their natural enemies is essential, in order to adequately controlling them through integrated methods.

References

- CARVALHO, A. R.; MELLO, R. P.; D'ALMEIDA, J. M. Uma revisão sobre himenópteros parasitóides de moscas sinantrópicas, seus principais hospedeiros e habitats no Brasil. *Entomologia y Vectores*, Rio de Janeiro, v. 10, n. 2, p. 237-253, 2003.
- FERREIRA, M. J. M. Sinantropia de dípteros muscóides de Curitiba, Paraná: Calliphoridae. *Revista Brasileira de Biologia*, Rio de Janeiro, v. 38, n. 2, p. 445-454, 1978.
- GREENBERG, B. *Flies and disease: ecology, classification and biotic association*. New Jersey: Princeton University Press, 1971.
- MARCHIORI, C. H.; PEREIRA, L. A.; SILVA FILHO, O. M.; RIBEIRO, L. C. S.; BORGES, V. R. Ocorrência de *Brachymeria podagrica* (Fabricius) (Hymenoptera: Chalcididae) como parasitóide de dípteros coletados em diferentes substratos em Itumbiara, Sul de Goiás, Brasil. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*, Belo Horizonte, v. 55, n. 2, p. 246-248, 2003.
- SILVEIRA, G. A. R.; MADEIRA, N. G.; AZEREDO-ESPIN, A. M. L. Levantamento de microhimenóptera parasitóides de dípteros de importância médico-veterinária no Brasil. *Memórias do Instituto Oswaldo Cruz*, Rio de Janeiro, v. 84, n. 4, p. 505-510, 1989.

