
**PARASITOIDS OF SYNANTHROPIC FLIES
COLLECTED IN BOVINE KIDNEY IN ITUMBIARA,
STATE OF GOIÁS, BRAZIL**

Carlos Henrique Marchiori,¹ Luiz Alex Pereira,² Otacilio Moreira Silva Filho,² Lalyne Cristhine Silva Ribeiro² and Vanessa Rodrigues Borges²

ABSTRACT

Species of parasitoids associated with synanthropic flies were collected in bovine kidney, in Itumbiara, State of Goiás, from March 2001 to March 2002. The pupae were obtained by the flotation method. They were individually placed in gelatin capsules until the adult flies or their parasitoids emerge. The overall prevalence of parasitism was 23.9%. The parasitoids *Brachymeria podagrica*, *Nasonia vitripennis*, *Pachycrepoideus vindemiae*, *Paraganaspis egeria* and *Spalangia endius* presented a parasitism prevalence of 7.0%, 12.4%, 3.5%, 0.5% and 0.6%, respectively.

KEYWORDS: Diptera. Hymenoptera. Natural enemies. Parasitoids. Synanthropic flies.

Diptera is an optimal model for the study of synanthropy, not only because of its ecological importance, but also because of its medical-veterinary aspects, particularly being vectors of agents such as amoeba cysts, helminth eggs, pathogenic enterobacteria, viruses and fungi. Diptera is one of the largest order of insects, comprising abundant number of species as well as of individuals. Besides, these dipterous are of great medical and veterinarian importance since they may produce myiasis and may be vectors of microorganisms pathogenic to man and animals (Chow 1940, Greenberg 1971, D'Almeida 1992).

A diverse fauna of parasitoids, which are responsible for the natural control of these dipterous, develops together with flies. Since parasitoids occupy a superior trophic level, they act as determining factors on the population densities of their hosts due to the diversity of their physiological and behavioral adaptations. As a possibility to control these insects, the natural regulators may be used, such as parasitoids, that are the agents responsible for the reduction of the synanthropic fly populations (Mendes & Linhares 1993).

1 Professor do Instituto Luterano de Ensino Superior de Itumbiara-ULBRA

2 Bolsistas de Iniciação Científica do Instituto Luterano de Ensino Superior de Itumbiara (ILES-ULBRA).

Endereço para correspondência: Av. Uruguai, 686, Bairro Jardim América – Itumbiara-Goiás, 75500-000.

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The objective of this study was to evaluate the parasitoid species in bovine kidney. It was conducted in an urban area of the College of Agronomy (Faculdade de Agronomia), located in Itumbiara County, State of Goiás, Brazil (18°25'S; 49°13' W). Flies were attracted to traps made of dull black tin-foil cans, measuring 19 cm in height and 9 cm in diameter, with two venetian blind type openings placed in the inferior third to allow the insects to enter. To the upper part of the cans, nylon funnels with open extremities and bases turned down were attached. These traps were then wrapped in plastic bags, which, after later removal, would allow the capture of flies and parasitoids. Bovine kidney deposited on top of a soil layer was placed as bait inside each can. Five of these traps were suspended on *Eucalyptus* sp. trees at 1 m above the soil level, 2 m apart from each other and 50 m away from a domestic garbage deposit. The specimens collected were taken to the laboratory, killed with ethyl ether, and preserved in 70% ethanol for further identification. After retrieval of insects, the traps contents were placed into plastic containers, containing a layer of sand to serve as substrate for the larva population. After remaining 15 days in the field, the sand of these containers was sifted in order to extract the pupae produced in the natural environment. These pupae were then individually transferred to gelatin capsules (number 00) to obtain flies and/or parasitoids.

The prevalence of parasitism was calculated by the following formula: $P = (\text{parasite pupae} / \text{total of pupae}) \times 100$ (Margolis et al. 1982, Bush et al. 1997). The preference of species for time of feces exposure was analyzed by the chi-square test.

From March 2001 to March 2002, 1070 pupae of Diptera and 256 specimens of parasitoid were collected. The overall prevalence of parasitism was 23.9%. The high prevalence of parasitism can also be related to the collections of gregarious parasitoids.

Among the Diptera, *Peckia chrysostoma* (Wiedemann) (Diptera: Sarcophagidae) was the most abundant, comprising 51.7% of sampled insects, followed by *Chrysomya albiceps* (Wiedemann) (Diptera: Calliphoridae) with 33.6% (Table 1). From the hosts collected we should point out the importance of the species *C. albiceps*, because of its medical importance for being responsible for the production of primary myiasis and more frequently, secondary myiasis as well (Queiroz et al. 1996). It has also a significant role as predator of other dipterous larvae. On the other hand, this dipterous takes relevant importance in public health, for being the vehicle of pathogenic microorganisms to human beings (Greenberg 1971; Marchenko 1985).

Among the parasitoids collected (Table 1), *Nasonia vitripennis* (Walker) (Pteromalidae) was the most frequent species (52.0%), followed by *Brachymeria podagrica* (Fabricius) (Chalcididae) (29.3%). *Nasonia vitripennis* behaves as gregarious parasitoid, it is ectoparasitoid in pupae of a variety species from the Diptera families, privately the Calliphoridae, Muscidae, Sarcophagidae and Tachinidae (Rivers & Denlinger 1995).

Brachymeria podagrica, *N. vitripennis*, *Pachycrepoideus vindemiae* (Rondani) (Pteromalidae), *Paraganaspis egeria* (Díaz, Gallardo & Wash) (Hymenoptera: Figitidae) and *Spalangia endius* (Walker) (Pteromalidae), presented a parasitism prevalence of 7.0%, 12.4%, 3.5%, 0.5% and 0.6%, respectively. A great number of individuals were obtained from the host *C. albiceps* in a total of 168 (46.7%) (Table 2).

Table 1. Parasitoids collected in bovine kidney from March 2001 to March 2002 in Itumbiara, State of Goiás, Brazil.

Taxonomic Group	frequency	percentage
DIPTERA:		
Calliphoridae:		
<i>Chrysomya albiceps</i>	360	33.6
<i>Hemilucilia flavifacies</i>	43	4.0
Fanniidae:		
<i>Fannia pusio</i>	41	3.8
Sarcophagidae:		
<i>Oxysarcodexia thornax</i>	73	6.8
<i>Peckia chrysostoma</i>	553	51.7
Total	1070	99.9
HYMENOPTERA:		
Chalcididae:		
<i>Brachymeria podagrica</i>	75	29.3
Figitidae:		
<i>Paraganaspis egeria</i>	05	2.0
Pteromalidae:		
<i>Nasonia vitripennis</i>	133	52.0
<i>Pachycrepoideus vindemiae</i>	37	14.4
<i>Spalangia endius</i>	06	2.3
Total	256	100

Table 2. Synanthropic flies and their parasitoids collected in bovine kidney from March 2001 to March 2002 in Itumbiara, State of Goiás, Brazil.

Taxonomic Group	frequency	Species	frequency	prevalence
<i>Fannia pusio</i>	41	<i>Paraganaspis egeria</i>	05	12.2
<i>Chrysomya albiceps</i>	360	<i>Nasonia vitripennis</i>	133	36.9
		<i>Pachycrepoideus vindemiae</i>	35	9.7
<i>Hemilucilia flavifacies</i>	43	<i>Brachymeria podagrica</i>	03	7.0
<i>Oxysarcodexia thornax</i>	73	<i>Brachymeria podagrica</i>	11	15.1
<i>Peckia chrysostoma</i>	553	<i>Brachymeria podagrica</i>	61	11.0
		<i>Pachycrepoideus vindemiae</i>	02	0.4
		<i>Spalangia endius</i>	06	1.1

The collected parasitoids showed the following preferences for flies: *P. vindemiae* by *C. albiceps*, *B. podagrica* by *Oxysarcodexia thornax* (Wiedemann) (Diptera: Sarcophagidae) and by *P. chrysostoma* ($\lambda^2=352.3$; GL=16; $P<0.0001$).

Since the use of some chemical substances to control this fly may cause damages to the environment as well as to human health, the search for effective natural enemies might be a viable alternative to hold this vector in a control program.

RESUMO

Parasitóides de moscas sinantrópicas coletados em rim bovino em Itumbiara, estado de Goiás, Brasil

Foram coletadas espécies de parasitóides associadas com moscas sinantrópicas em rim bovino em Itumbiara, no estado de Goiás, entre março de 2001 e março de 2002. As pupas foram obtidas pelo método de flutuação, sendo colocadas individualmente em cápsulas de gelatina até a emergência de moscas adultas ou seus parasitóides. A prevalência de parasitismo foi de 23,9%. Os parasitóides *Brachymeria podagrica*, *Nasonia vitripennis*, *Pachycrepoideus vindemiae*, *Paraganaspis egeria* e *Spalangia endius* apresentaram a prevalência de parasitismo de 7,0%, 12,4%, 3,5%, 0,5% e 0,6%, respectivamente.

DESCRITORES: Diptera. Hymenoptera. Inimigos naturais. Parasitóides. Moscas sinantrópicas.

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