

## **GNATHOPLEURA SEMIRUFA (BRULLÉ, 1846) PARASITOID OF DIPTEROUS SYNANTHROPIC IN SOUTHERN OF GOIÁS, BRAZIL**

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### **ABSTRACT**

*This work reports the occurrence of parasitoid *Gnathopleura semirufa* (Brullé, 1846) (Hymenoptera: Braconidae) parasitizing *Oxysarcodexia thornax* (Walker) (Diptera: Sarcophagidae), *Peckia chrysostoma* (Wiedemann) (Diptera: Sarcophagidae) and *Sarcodexia lambens* (Wiedemann) (Diptera: Sarcophagidae) in Brazil. The pupae were obtained by the flotation method. They were individually placed in gelatin capsules until the emergence of flies or their parasitoids. The percentage of parasitism of *O. thornax*, *P. chrysostoma* and *S. lambens* was 24.6%, 35.7% and 17.0%, respectively.*

**KEY WORDS:** *Insecta, Diptera, biocontrol, Hymenoptera, enemy natural*

### **INTRODUCTION**

The flies included in the infra-order Muscomorpha have medical and veterinary importance, since they may produce myiasis and act in carrying pathogens to man and animals. They have been found to carry more than 100 species of disease-causing organisms such as bacteria, virus, protozoa and helminthes and are agricultural pests (Greenberg, 1971; Scatolini and Dias, 1997).

Figitidae behave as primary parasitoids of dipterous larvae that develop in the feces of cattle and agricultural pests such as fruit flies (Tephritidae) on fruit and *Dettmeria euxestae* Borgmeier, 1935 (Hymenoptera: Figitidae) in *Euxesta eluta* Loew, 1996 (Diptera: Otitidae) on corn. Moreover, they reduce the economic losses caused by the melon fly and *Zaprionus indianus* Gupta (Diptera: Drosophilidae) in figs (Askew and Shaw, 1986).

The Sarcophagidae are distributed worldwide and contains about 2600 known species (Pape, 1996). Are present in all biogeography regions, but mostly concentrated in tropical climate to warm temperate (Mcalpine, 1983). The neotropical fauna of Sarcophagidae is very diverse, with over 750 described species (Pape, 1996), and although despite this, little is known about the biology of the group in this region. As a possibility to control these flies certain groups of parasitoids, agents responsible for reducing flies can be used (Marchiori *et al*, 2002).

**MARCHIORI:** *Gnathopleura semirufa* (Brullé, 1846) parasitoid of dipterous synanthropic in Southern Goiás, Brazil

Parasitoids are important regulators of insect populations and stand out as the main group of natural enemies in agricultural systems. Are dispersed in several families of insects and their adaptation to the parasitic mode of life is more diverse and abundant in Hymenoptera (Panizzi and Parra, 2009).

The Braconidae are one of the largest Hymenoptera families, with approximately 40,000 species (Sharkey, 1993), divided into 45 subfamilies (Achterberg, 1992). The most common hosts of braconids are the larvae of Lepidoptera, Coleoptera and Diptera.

The Alysini are a large subfamily of Braconidae containing over 1,000 described species worldwide. All alysiines are koinobiont endoparasitoids of cyclorrhaphous Diptera (Wharton, 1984). They larviposit or oviposit on the host, the larvae penetrate into the host and the adults emerge from the puparia.

The aim of this study was to record the parasitoid *Gnathopleura semirufa* (Brullé, 1846) (Hymenoptera: Braconidae) parasitizing flies of the family Sarcophagidae in Brazil.

#### **MATERIALS AND METHODS**

The study on pitfall traps was also conducted on the campus of the Agronomy School in Itumbiara, southern of Goiás, between January and November 2005. Each trap consisted of a plastic receptacle (basin) of 15 cm in diameter by 10 cm in height. Each receptacle was buried in earth, such that its upper extremity was at the ground surface level. One liter of water, 20 ml of detergent and 2 ml of formol were placed in each receptacle. A 200 ml pot was attached to the basin by means of a thin wire that went across it close to its edge, so as to keep the pot hanging and centralized in the basin. The bait, consisting of human feces, was placed in this pot. This trap was protected by another plastic receptacle of the same measurements (15 x 10cm), which functioned as a cover. This contained four diametrically opposite holes of around 5 cm in diameter and 7 cm in height, and was supported on a metal wire suspended 10 cm from the group (fig.1).

Five traps were used, with separations of two meters between each other, placed randomly. The bait was replaced every 15 days. The pupae that were found in the bait were separated out by means of the floatation method. These were then individually packed in gelatin capsules until the parasitoids emerged.

The percentage parasitism of each parasitoid species was calculated by means of the number of pupae parasitized per species of parasitoid, divided by total number of pupae from that host, and multiplied by 100.



Fig.1. General appearance of the pitfall trap

## RESULTS AND DISCUSSIONS

Collected from 305 pupae *Oxysarcodexia thornax* (Walker) (Diptera: Sarcophagidae), 143 *Peckia chrysostoma* (Wiedemann) (Diptera: Sarcophagidae) and 182 of *Sarcodexia lambens* (Wiedemann) (Diptera: Sarcophagidae) that emerged 75, 51 and 31 parasitoid species *G. semirufa* (fig. 2), respectively (table 1).



Fig.2. General appearance of the parasitoid *Gnathopleura semirufa*

Table 1. Registration *Gnathopleura semirufa* (Brullé, 1846) parasitizing the dipterous family Sarcophagidae listed in Itumbiara, southern of Goiás, using pitfall trap, in the period January at November 2005.

Diptera	Frequency Dipterous	Frequency Parasitoid	Pupae parasitizing	Percentage of parasitism
Sarcophagidae:				
<i>Oxysarcodexia thornax</i>	305	75	75	24,6
<i>Peckia chrysostoma</i>	143	51	51	35,7
<i>Sarcodexia lambens</i>	182	31	31	17,0
Total	630	157	157	-----

The total percentage parasitism observed was around 25.0%. The host showing the highest percentage parasitism was *P. chrysosotoma* in cattle liver (table 1), and this was probably due to the seasonality factor presented by this species.

**MARCHIORI:** *Gnathopleura semirufa* (Brullé, 1846) parasitoid of dipterous synanthropic in Southern Goiás, Brazil

The percentage of parasitism observed in *O. thornax*, *P. chrysosotoma* and *S. lambens* was 24.6%, 35.7% and 17.0%, respectively (table 1). Probably, these parasitism obtained may have been due to variations in the quality and availability of food resources or the densities of hosts. Barros *et al* (2006) reported *Peckia* (*Squamatodes*) *trivittata* (Curran) (Diptera, Sarcophagidae) being parasitized by *G. semirufa* in the savanna of Brasília, DF.

Among the means for controlling flies, chemical insecticides are the most widely used. However, these may lose their efficiency as populations gradually become insecticide-resistant. The resistance to insecticides shows the growing need to introduce alternative insect control programs, for instance the biological control. It is possible to control these insects, by using the natural regulators such as parasitoids, which are the responsible agents for the reduction of the insects pests populations Scatolini and Dias, 1997; Silveira *et al*, 1989; Marchiori *et al*, 2000; Parra, 2001).

### CONCLUSION

These pitfall traps are used for the study of Diptera and Hymenoptera parasites and also reports the first occurrence of *G. semirufa* parasitizing *O. thorax*, and *P. chrysosotoma* and *S. lambens* in southern Goiás, Brazil

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