



Brontaea debilis (Thomson, 1896) (Diptera: Cyclorrhapha: Muscidae) as host for *Spalangia drosophilae* Ashmead, 1885 (Hymenoptera: Pteromalidae: Spalanginae) in Brazil

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Abstract

The flies included in the infra-order Cyclorrhapha (Muscomorpha) have medical and veterinary importance, since they may produce myiasis and act in carrying pathogens to man and animals. The experiment was carried out at the Federal University of Goiás farm in Goiânia, Goiás, Brazil. Every fortnight, ten dishes black plastic containers containing bovine feces were exposed for fifteen days in the pastures. After this period, the feces were sent to the laboratory for pupae extraction. The experiments were carried out from April 2006 to December 2007. Ninety-two pupae of *Brontaea debilis* (Thomson, 1896) (Diptera: Muscidae), from bovine feces, from which 31 specimens of *Spalangia drosophilae* Ashmead, 1887 (Hymenoptera: Pteromalidae) were emerged. The percentage of parasitism was 33.7%. *Spalangia drosophilae* is cited in the literature as parasitoid of the pupae of Diptera including Chloropidae, Drosophilidae, Muscidae, Sarcophagidae and Sepsidae.

Keywords: Hymenoptera; Parasitoids; Biocontrol; Cattle; Feces

1. Introduction

The flies included in the infra-order Muscomorpha (Cyclorrhapha) 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, protozoa and helminthes. Parasitoids are responsible for reducing the populations of flies that proliferate on various substrates. Evaluation of these species for natural control over these insects is important for enabling studies that aim towards subsequent selection of species for use in biological control programs [1, 2].

The genera *Spalangia* (Hymenoptera: Spalanginae: Pteromalidae) presents pupal parasitoids associated with flies of the families Muscidae, Calliphoridae, Sarcophagidae, Drosophilidae, Chloropidae, Sepsidae and others. Many known species develop in hosts that live in feces, and decaying meat plant tissues. *Spalangia* species, predominantly associated with manure, are parasitoids of pupae [3, 4].

The purpose of the manuscript is to report a new host-parasitoid relationship in Brasil: *Brontaea debilis* (Thomson, 1826) (Diptera: Cyclorrhapha Muscidae) as host for *Spalangia drosophilae* Ashmead, 1887 (Hymenoptera: Pteromalidae: Spalanginae) in Goiás, Brazil.

2. Material and methods

The experiment was carried out at the Federal University of Goiás farm in the central region of Goiás, Brazil. Every fortnight, ten dishes black plastic containers (Figure 1) containing bovine feces were exposed for fifteen days in the

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pastures. After this period, the feces were sent to the laboratory for pupae extraction. Pupae were removed with the aid of a sieve, counted and stored individually in glass jars. The flies that emerged were identified morphologically. The experiments were carried out from April 2006 to December 2007.



Figure 1 Bovine feces present in black plastic containers

3. Results and discussion

Ninety-two pupae of *Brontaea debilis* (Thomson, 1896) (Diptera: Cyclorrhapha: Muscidae), from bovine feces, from which 31 specimens of *S. drosophilae* were emerged. The percentage of parasitism was (31/92) 33.7%. The parasitism successful rate can be influenced by the availability of resources, density hosts and to the searching capacity of the parasitoids (Figure 2).



Figure 2 *Brontaea* (Diptera: **Cyclorrhapha**: Muscidae); Source: <https://bugguide.net/node/view/815965>



Figure 3 *Spalangia drosophilae* Ashmead 1885 (Hymenoptera: Pteromalidae: Spalanginae); Source: boldsystems.org/index.php/Taxbrowser_Taxonpage?taxid=484379

Spalangia drosophilae is cited in the literature as parasitoid of the pupae of Diptera including Chloropidae, Drosophilidae, Muscidae, Sarcophagidae and Sepsidae (Figure 3) [4].

Brontaea debilis had previously been found to be parasitized by the following parasitoids *Spalangia cameroni* Perkins, 1910, *Spalangia nigra* Latreille, 1805 and *Spalangia nigroaenea* Curtis, 1839. However, there is no record hitherto on the parasitism of *B. debilis* by *S. drosophilae* [5,6].

4. Conclusion

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.

Compliance with ethical standards

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References

- [1] Greenberg B. Flies and disease - ecology, classification and biotic association. New Jersey: Princeton University Press. 1971.
- [2] Marchiori CH. Microhimenopterous parasitoid flies on cattle manure in Cachoeira Dourada, Goiás, Brazil. *Entomologia y Vectores*. 2002; 9: 365-374.
- [3] Mendes J, Linhares AX. Attractiveness of baits, seasonality and ovarian development in several species of Muscidae (Diptera). *Revista Brasileira de Entomologia*. 1993; 37: 289-297.
- [4] Marchiori CH, Caldas ER, Dias KGS. Parasitoids of Diptera in cattle feces at various exposure times in Itumbiara, Goiás, Brazil. *Arquivos do Instituto Biológico*. 2002; 69: 37-42.
- [5] Marchiori CH, Silva Filho OM, Milhomem SEM, Leles AS. Dipterous parasitoids collected in buffalo dung. Brazil. *Biotemas*. 17(2): 97-204.
- [6] Marchiori CH, Silva Filho MO. Microhymenoptera of the genus *Spalangia* (Hymenoptera: Pteromalidae: Spalanginae) collected on various substrates in southern Goiás State, Brazil. *Biotemas*. 2008; 18 (2): 219 - 225.