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Parasitoids of the Pteromalidae Family in the biological control of Diptera in Brazil.

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The family Pteromalidae (Hymenoptera, Chalcidoidea) includes a large number of parasitoid species, many of which are important in the biological control of synanthropic muscoids (Rueda and Axtell, 1985). They can be solitary or gregarious, ectoparasitoids or endoparasitoids, primary or secondary parasitoids, coobiontes or idiobiontes. Most are idiobiontes and many develop as ectoparasitoids in larvae or pupae of Diptera, Coleoptera, Hymenoptera, Lepidoptera and Siphonaptera (Rueda and Axtell, 1985). Thus, we sought to know the Pteromalidae associated with muscoids in cattle manure and other insects in organic matter of rotting animal origin (Sereno and Neves, 1993).

Every fortnight, 10 plates of fecal cake (of approximately 3 kg each) were produced from fresh bovine feces that were collected immediately after defecation in pastures of Brachiaria brizantha (Hochst ex. A. Rich) and in corrals. The material was collected in plastic buckets and was homogenized. It was then placed in 10 round plastic supports of 20 cm in diameter, with a hole to allow rainwater to drain away. This methodology was used for precise determination of the time between the emission of the fecal cake and its collection. The feces remained exposed (five in the pastures and five in the corrals) for 15 days. After this period, the feces were taken to the laboratory for extraction of pupae by means of the flotation method. The pupae were removed with the aid of a sieve; they were counted and individually stored in gelatin capsules (number 00) until the flies and/or parasitoids emerged. The parasitoids and flies that emerged were identified with the aid of a stereoscopic microscope and were conserved in 70% alcohol.

The flies were collected by using traps, made of dark cans measuring 19 cm in height and 9 cm in diameter, with two openings resembling blinders, located in the lowest third of the can, to allow flies to enter. The top of the can was connected to a nylon funnel that was open at both ends, with the base pointing down. This was wrapped in plastic bags, so that when they were removed, the flies and parasitoids could be collected. The following

items were used as baits: human feces, cattle kidneys, cattle liver, chicken and fish which were placed inside the cans, over a layer of earth. Five traps were used and they were hung on trees at a height of one meter above the ground, two meters apart from each other. The insects collected were taken to the laboratory, sacrificed with ethyl ether and kept in 70% alcohol for further identification. To obtain the parasitoids, the contents of the traps were placed in plastic containers with a layer of sand for use as a substrate for transformation of the larvae into pupae. This sand was sifted after being in the fields for 15 days and the pupae were extracted from it and were individually placed in gelatin capsules (number 00) in order to obtain the flies and/or parasitoids.

In traps containing bovine liver, only one species of Pteromality, *Nasonia vitripennis* (Walker) was found in pupae of *Chrysomya albiceps* (Wiedemann) (Calliphoridae). The parasitoids obtained were gregarious, but this study did not count the number of emerged individuals of each pupa (Sereno and Neves, 1993).

Nasonia vitripennis behaves as a gregarious parasitoid, is an ectoparasitoid in pupae of several species of Diptera families, particularly Calliphoridae, Muscidae, Sarcophagidae and Tachinidae (Cardoso and Milward-De-Azevedo, 1995). The percentage of parasitism obtained by this species in this work was of 45.50%.

Regarding the preference of parasitoids for their hosts in catle dung, it was found that: *Spalangia drosophilae* (Ashmead), for pupae of *Palaeosepsis* spp. (Diptera: Sepsidae) and *Spalangia endius* (Walker), by pupae of *Brontaea quadristigma (*Thomson) (Diptera: Muscidae), *Cyrtoneurina pararescita* (Couri) (Diptera: Muscidae) and *Sarcophagula occidua* Fabricius (Diptera: Sarcophagula); *Spalangia nigroaenea* Curtis, by *B. quadristigma, Brontaea debilis* (Williston) (Diptera: Muscidae), *C. pararescita* and *S. occidua*; *Spalangia* sp. by pupae of *B. debilis* and *S. occidua* ($X2 = 42, 19$; $GL = 16$; $P < 0.0001$).

Spalangia drosophilae was the most abundant parasitoid in this study and with parasitism percentage of 44.6% in *Palaeosepsis* spp.

The results suggest that this parasitoid could be used in future biological control programs of synanthropic flies due to its afore mentioned polyphagia.

References

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