Comunicação Científica

Natural Enemies of *Chlosyne lacinia saundersii* Doubl. & Hew. (Lepidoptera: Nymphalidae) in the State of São Paulo

Ana. E.C. Campos-Farinha[1] and Nozor P.O. Pinto[2]
[1]Departamento de Biologia, UNESP, Caixa postal 199, 13506-900, Rio Claro, SP.
[2]Departamento de Ecologia, UNESP, Caixa postal 199, 13506-900, Rio Claro, SP.

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Inimigos Naturais de *Chlosyne lacinia saundersii* Doubl. & Hew. (Lepidoptera: Nymphalidae) no Estado de São Paulo

RESUMO - Um estudo dos inimigos naturais da lagarta do girassol *Chlosyne lacinia saundersii* foi realizado em Rio Claro, Estado de São Paulo, sendo observadas cinco espécies de parasitóides, das quais quatro são mencionadas pela primeira vez neste hospedeiro: *Conura* (*Spilochalcis*) sp1, *Conura* (*Spilochalcis*) sp2, *Brachymeria* (*Brachymeria*) *minestor* (Walker) (Hymenoptera: Chalcididae) e *Pterocermus* sp. (Hymenoptera: Ichneumonidae). Predadores também foram observados, dentre eles, aves, formigas e vespas.

PALAVRAS-CHAVE: Insecta, parasitóides, predadores, *Chlosyne lacinia saundersii*.

The sunflower (*Helianthus annuus*) crop is the second source of edible oil in the world and suffers significative losses due to insect attack, specially by defoliators (Lourenção & Úngaro 1983). The sunflower caterpillar, *Chlosyne lacinia saundersii* Doubl. & Hew. (Lepidoptera: Nymphalidae), is important for its frequence and abundance wherever sunflower is cultivated in Brazil. This species has gregary behavior, usually beginning the attack at the leaf borders, defoliating the plant when in high population densities (Moscardi & Corso 1988), leaving intact only the leaf veins (Lourenção & Úngaro 1983). Moscardi (1986) has investigated the occurrence of natural enemies of *C. l. saundersii* in Londrina, Paraná State for four years. The microhymenoptera *Trichogramma* sp. was observed on eggs, tachnids *Lespesia affinis* (Townsend) and *Euphorocera floridensis* (Townsend) were found attacking larvae, and many species of Hymenoptera Chalcididae in pupae of *C. l. saundersii*. In this study we described the occurrence of natural enemies of the sunflower caterpillar in a non-treated crop, during the period of the caterpillar infestation.

From May to September 1993 a high infestation of *C. l. saundersii* was registered in a flower bed of 12.8 m x 21.8 m located at the "Instituto de Biociências - UNESP" - Campus of Rio Claro, SP. Fifty sunflower plants infested by the sunflower caterpillars were daily observed. Predation on larvae and pupae by insects and birds was registered. Insect predators were collected and placed in 70% alcohol for identification.

C. l. saundersii pupae were observed to

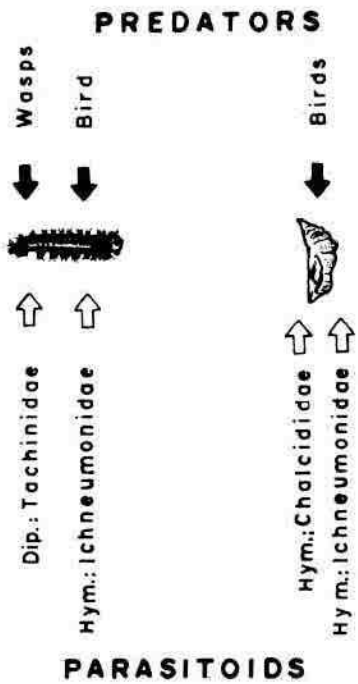

Figure 1. Developmental stages of *Chlosyne lacinia saundersii* susceptible to parasitoids and predators attack.

be parasitized by chalcidids in the area. Some of the parasitized pupae were collected, kept in the laboratory in 14 cm x 12.5 cm plastic boxes closed with a removable glass lit, and observed daily for the parasitoids emergence. The remaining parasitized pupae were left in the field, covered with a nylon mesh and observed daily. Day and time of parasitisms were also recorded. Emerged chalcidid adults were fed with a 1:1 honey solution and unparasitized pupae were offered to provide parasitism. Ichneumonids were observed parasitizing larvae. The same procedure of data collection described above was performed, except that no parasitized larva was left in the field. *C. l. saundersii* larvae and pupae, apparently not parasitized in field, were randomly collected every day and taken into the laboratory in order to observe other possible parasitoid species.

In June and July of 1993 a great number of sunflower caterpillars left their host plants, fixed on the walls around the flower beds and pupated. As soon as they pupated, numbered labels were placed beside them. A total of 100 pupae were labeled and daily observed in the morning and in the afternoon in order to record the percentage of parasitism and/or predation.

Out of the 50 sunflower plants observed, five parasitoid species were registered in the caterpillars of *C. l. saundersii* as follows: *Conura* (*Spilochalcis*) sp1, *Conura* (*Spilochalcis*) sp2, *Brachymeria* (*Brachymeria*) *minestor* (Walker) (Hymenoptera: Chalcididae), *Pterocermus* sp. (Hymenoptera: Ichneumonidae) and *Chetogena* sp. (Diptera: Tachinidae).

From the *C. l. saundersii* larvae and pupae parasitized in the field and taken to the

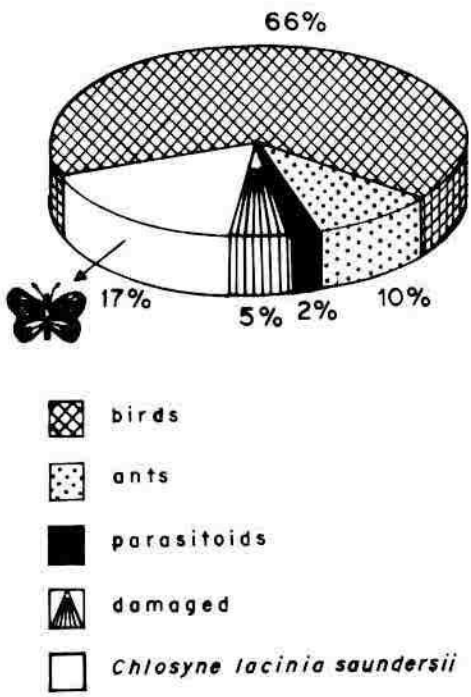

Figure 2. Percentages of parasitism, predation and adult eclosion of *Chlosyne lacinia saundersii* in the field.

laboratory, three species of chalcidids were identified: *Conura* (*Spilochalcis*) sp1, *Conura* (*Spilochalcis*) sp2 and *B. minestor*, and one specie of ichneumonid, *Pterocermus* sp. From the larvae and pupae collected at random, it was registered one specie of tachinid (*Chetogena* sp.).

The hymenopterans *Conura* (*Spilochalcis*) sp1, *Conura* (*Spilochalcis*) sp2, *B. minestor* and *Pterocermus* sp. were reported for the first time as parasitoids of *C. l. saundersii*. The chalcidid species parasitize the host only in the pupal stage, while the ichneumonid parasitizes either the last larval instars or pupae (Fig. 1). The sunflower caterpillar has six instars (Moscardi & Corso 1988). All hymenopteran parasitoids recorded emerged from the host in the pupal stage and were solitary ones. It was verified through the observations in the laboratory, that chalcidids took an average of 38 days to emerge from the host, while the ichneumonid emerged after 21 days. Besides the field studies, parasitism was also achieved in laboratory, in the rearing boxes, even for chalcidids and ichneumonids, indicating that these parasitoids are relatively easy to rear in non controlled conditions, in order to obtain more information on their biology. The chalcidid species showed prolonged longevity in the laboratory (95 days), with the exception of *B. minestor*. *Pterocermus* sp. had a life span of 37 days and occurred at higher population density.

Chetogena sp. parasitizes only the last *C. l. saundersii* larval instars (Fig. 1). This species is probably the same parasitoid observed by Moscardi & Corso (1988) in the State of Paraná, on this same host, with the ancient name of *E. floridensis*. As we did not obtain a male of this species, it could not be identified at the species level.

Five species of wasps were observed preying on the sunflower caterpillar as follows: *Polistes versicolor* (Olivier), *Polybia dimidiata* Olivier, *Polybia ignobilis* Haliday, *Polybia paulista* Ihering and *Protonectarina sylveirae* (Saussure) (Fig. 1). *P. ignobilis* was the most frequent species.

The bird species registered in the area during the period of study are showed in Table 1. Only *Passer domesticus*, *Troglodytes aedon*, *Furnarius rufus* and *Zonotrichia capensis* were observed preying *C. l. saundersii* pupae. The latter also preyed larval stages besides pupae (Fig. 1). The remainig species in Table 1 apparently did not prey any stage of the pest.

Table 1. Observed birds in the experimental area during the study.

Brazilian Common Name	Scientific Name
João de Barro	*Furnarius rufus*
Suiriri	*Tyrannus melancholicus*
Bem-te-vi	*Pitangus sulphuratus*
Risadinha	*Camptostoma obsoletum*
Corruira	*Troglodytes aedon*
Sabiá-do-Campo	*Mimus saturninus*
Sabiá-Laranjeira	*Turdus rufiventris*
Chopin	*Molotrus bonariensis*
Tico-Tico	*Zonotrichia capensis*
Pardal	*Passer domesticus*

From the 100 labeled pupae, 66% were preyed by birds *Z. capensis*, *F. rufus*, *T. aedon* and *P. domesticus* (Fig. 2). A complementary study was performed with 52 *C. l. saundersii* pupae in January and February 1994, also using the numbered labels. All pupae were preyed by a couple of *Z. capensis* which at that time had a nest with four nestlings next to the experimental area, being one of them a *Molotrus bonariensis* specimen. Ten per cent of pupae were attacked by ants, *Crematogaster* (*Orthocrema*) sp. and *Monomorium pharaonis* (Linnaeus) (Fig. 2). Five per cent of the pupae were found damaged, 17% emerged and 2% were parasitized by *Conura* (*Spilochalcis*) spp. and *Pterocermus* sp. (Fig. 2). The observed parasitism peak in these months occurred from 11:00 a.m. to 3:00 p.m., at an average temperature of 26°C and relative humidity of

48.6%. Such low percentage of parasitism in this part of the experiment is different from those observed by Moscardi & Corso (1988), who found 59% of parasitism in *C.l. saundersii* pupae in the State of Paraná.

Observations reported in this work bring further knowledge of the natural enemies of the sunflower caterpillar, therefore, other studies should be developed, because it is demonstrated in this paper that is relatively easy to maintain the Hymenoptera parasitoids in the laboratory.

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