

[1677] HOST LOCATION BEHAVIOR OF THE PARASITOID FLY, *EXORISTA JAPONICA* (DIPTERA: TACHINIDAE)

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We examined the response of female *Exorista japonica* to an herbivore-damaged plant in a wind tunnel and the effect of host frass or its extracts on the host location of females in a small cage. We used the common armyworm, *Mythimna separata* Walker (Lepidoptera: Noctuidae), as a host for this fly and as an herbivore to damage corn plants. Experienced flies conditioned to oviposit on the host/corn plant complex were attracted mostly to the host/plant complex and required a relatively short time to arrive at the plant. Damaged corn plants without host larvae and their frass were also attractive. However, only a few experienced flies were attracted to the undamaged plants. These two responses indicate that the damaged corn plants without the herbivore present emit an attenuated signal odor for female flies. Host searching time in the patch and the number of patch visits were analyzed by using a frass-containing patch (9cm in diam.) which was excreted from host larvae, and the patches to which host frass extracts with various solvents were applied. *E. japonica* females were arrested in response to the frass-containing patch after contacting the frass with their front tarsi, thereby they spent most of the time on searching the patch and continued to visit it. The females also exhibited area-restricted search on the methanol extract of host frass that was applied to a 9-cm filter paper. It is suggested that *E. japonica* females employ chemicals from host frass as arrestant in close-range host location.

Index terms: *Exorista japonica*, Tachinidae, *Mythimna separata*, Noctuidae, common armyworm, damaged plant volatile, host frass, arrestant.

[1678] SPATIO-TEMPORAL DISTRIBUTION OF CITRUS LEAFMINER AND ITS NATURAL ENEMIES IN SÃO PAULO STATE, BRAZIL

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The citrus leafminer (clm) *Phyllocnistis citrella* Stainton (Lepidoptera: Gracilariidae) was reported in Brazil in 1996. This pest became a real threat for national citrus crops because of its association with *Xanthomonas axonopodis* pv *citri*, bacterial agent of the citrus canker. The objective of this work was to analyse during different seasons and growing periods the population fluctuations of immature stages of clms and of its most common natural enemies. Obtained data would also be used to validate a deterministic model (under development at present) describing the dynamic of parasitoid-pest interactions. The experiment was realized in a plantation located in Cordeirópolis, São Paulo state. To avoid heterogeneity, a 9 years-old experimental field of citrus variety 'pera' was selected and divided in 10 blocks composed of 18 plants each. At each sampling operation, conducted monthly from May 1999 to April 2000, one plant per block was randomly selected. The plant was divided in 3 equal strata (basal, medium and apical) and one branch per stratum was collected. Each branch received identification (block number and stratum) and was kept in plastic bag for further lab observations. To analyse tree shade effect, cardinal position of branches was also recorded. In the lab, the 15th first leaves of each branch were analysed under stereomicroscope (the youngest leaf of branch being always considered as the first one). The number of eggs, larvae (1st and 2nd instars) and pupae of clm and *Galeopsomyia fausta* (the most common natural enemy in the region) was counted. The presence of *Cirrospilus* 'sp.' (other native natural enemy) and *Agonaspis citricola* (exotic parasitoid released in areas closed to our experimental field) was also recorded. Spatio-temporal distributions of clm were statistically analysed. Data will also be used to validate the simulation model under development. Informations resulting from different simulations would help to assess the impact of parasitoid-pest interactions and the efficacy of biological control in the field.

Index terms: *Phyllocnistis citrella*, *Galeopsomyia fausta*, parasitoid-pest interactions, modelling, spatio-temporal distribution, citrus.

[1679] BIONOMICS OF *AMBLYSEIUS LONGISPINOSUS* (PHYTOSEIDAE) AND ITS EFFICACY AS A BIOLOGICAL CONTROL AGENT OF *EOTETRANYCHUS CENDANAI* (TETRANYCHIDAE)

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The egg, larval, protonymphal and deutonymphal stages of *Amblyseius longispinosus* (Evans) that fed on *Eotetranychus cendanai*, required 2.02 ± 0.13 , 0.57 ± 0.71 , 1.02 ± 0.27 and 1.16 ± 0.53 days. The total developmental time was 4.79 ± 0.61 days. Female longevity averaged 14.61 ± 2.88 days where 19.54 ± 6.36 eggs/female or 1.33 ± 0.29 eggs/female/day were laid. Highest predation rate was detected at a density of 40-50. *Amblyseius longispinosus* could be employed as biological agent of *E. cendanai* both in laboratory and greenhouse conditions at the predator: prey ratio of 1: 30-1:50.

Index terms: *Amblyseius longispinosus*, *Eotetranychus cendanai*.

[1680] PERISTENUS PARASITISM OF *LYGUS LINEOLARIS* IN MULTIPLE PLANT HABITATS

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The habitat range across which a parasitoid can locate hosts is an important aspect of its biology, and also has clear implications for biological control. How effective is a parasitoid at targeting a pestiferous host when the host is a habitat generalist whose location may be more variable and less predictable than a specialist's? The host species in this study, *Lygus lineolaris* (Heteroptera: Miridae), is native to and occurs throughout North America. One of the broadest herbivore generalists, it has been documented on 328 plant species of 55 plant families in 30 orders. It is pestiferous on an unusually broad range of annual and perennial crops. In North America, a suite of both native and introduced parasitoid species include *L. lineolaris* in their host ranges. Three of these species are *Peristenus digoneutis* (Hymenoptera: Braconidae), *P. pallipes*, and *P. pseudopallipes*. *P. digoneutis*, a European species parasitic on *L. rugulipennis*, was collected in European alfalfa and released in the U.S. for biological control of *L. lineolaris*. Its geographic range expansion has been monitored in alfalfa, and overlaps the geographic ranges of both *P. pallipes* and *P. pseudopallipes*. But given the broad range of plant habitats where *L. lineolaris* occurs, what is the parasitoid species richness and abundance encumbering the host taxon in different habitats? Stated another way, in which habitats will the various species track the host? The purpose of this study has been to survey patterns of parasitism in *L. lineolaris* in plant habitats other than alfalfa, the habitat of introduction for *P. digoneutis*. These habitats include strawberry (a high-value crop in which *L. lineolaris* is a key pest), weed species, rye/vetch cover crops, and old-fields. We are assessing parasitism by *Peristenus* species in these environments. Though sample analysis for all species and habitats was not complete at the time of writing, so far we have found *P. digoneutis* parasitism of *L. lineolaris* in strawberry, rye/vetch, and on *Erigeron* sp. in naturalized habitats. Thus, *P. digoneutis* finds and parasitizes its generalist host in multiple plant habitats.

Index terms: *Peristenus digoneutis*, *Peristenus pallipes*, parasitoid, host location