

Project FLYPRED - Has tiger-fly a role in biological control of protected crops?

Projecto

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The tiger-fly *Coenosia attenuata* Stein 1903 (Diptera: Muscidae) is a generalist predator in larval and adult stages (Fig. 1). According to the results obtained in our project, it is a very promising biological control agent against insect pests in agricultural ecosystems.



Figure 1. *Coenosia attenuata* adult feeding on a whitefly (photo by Rosângela Payer)

An optimized lab rearing methodology for *C. attenuata* was obtained, based on larvae and adults of fungus gnats and on drosophilid adults, with a substrate of soil, mixed with coconut fibres and whole oat grains inoculated with *Pleurotus ostreatus* (Jacq.) P. Kumm. fungi. From seventeen potential prey (up to 5mm long) tested, only *Trichogramma evanescens* was not attacked. Fast moving insects were preyed when not flying, contradicting literature.

Apparently, adults of drosophilids, fungus gnats, whiteflies and leafminers were preferred upon to some parasitoids (e.g. *Diglyphus isaea* (Walker)). There was no preference between leafminers and whiteflies or between drosophilids and leafminers. Only in thrips vs *D. isaea*, a beneficial insect was preferred. The predation holes in the prey were mainly in the occiput dorsal part; their number and the attack duration depended on the prey (from 0.16 to 43.1 min). Predator females consumed daily 5.1 to 6.0 drosophilid adults (higher than in literature) and 10.1 to 12.1 *D. isaea* adults. Prey's colour did not influence predation. In lab arena, white sticky surfaces attracted more predators than yellow, green, blue and red; no differences occurred between blue and yellow sticky traps inside greenhouses. In lab, the presence of earthworms' mucus or fungus gnat larvae induced more ovipositor extensions and higher oviposition by *C. attenuata*. Alive intact earthworms were not preyed (only sliced ones). Cannibalism was detected in predator adults; not in larvae. Females ate males more often than the opposite; predators survived longer to cannibalism when other prey were present. Tiger-fly is native to Paleotropical and Mediterranean Basin and can be found in several ecosystems besides vegetable greenhouse crops. It is widespread in Portugal. The phylogeographic study on tiger-fly samples from Europe, North and South America and western Asia revealed generally high haplotype diversity but low nucleotide diversity, suggesting a recent expansion, and evidences of a recent

colonization of North and South America from the Palearctic.

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More information

<http://www.chil.org/produccion-vegetal/group/flypred>