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## Swarming of *Lamprolonchaea smaragdi* (Walker), (Diptera, Lonchaeidae) and a few other Diptera observed in Chios, Greece

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Males of *Lamprolonchaea smaragdi* (WALKER) (Diptera, Lonchaeidae) were observed swarming in Chios, Greece, in distinct places into the sun rays falling in between the branches of big trees, and their swarming behavior is described. Swarms of *Silba adipata* MCALPINE (Dipt., Lonchaeidae), *Delia platura* (MEIGEN) (Dipt., Anthomyiidae) and *Phora* sp. (Dipt., Phoridae) were also seen in the same locality.

Formation of aerial swarms is a common phenomenon among various orders of insects including many families of Diptera, especially Nematocera, and a few families of Brachycera such as Lonchaeidae (MCALPINE & MUNROE, 1968). The published reports on the swarming of lonchaeid flies concern the genera *Dasiops*, *Silba* and *Lonchaea* (MCALPINE & MUNROE, 1968 and references therein).

During a visit on the island of Chios, Greece, in September 1981 I detected lonchaeid flies swarming, and I watched their swarming behavior. Specimens netted from the swarms were identified as *Lamprolonchaea smaragdi* (WALKER) (= *L. aurea* MACQUART), a species whose larvae develop mostly in various fruits already infested by other insects, e. g. figs infested by the Mediterranean fruit fly *Ceratitis capitata* (WIEDEMANN) (SÉGUY, 1934).

### *Lamprolonchaea smaragdi*

The observations were made from September 8 to 22, 1981 and from August 4 to September 16, 1982 on a farm occupied mostly by citrus trees and vegetable fields. In and around the cultivated area and in the proximity of the farm buildings were various species of trees including several large fig and mulberry trees.

During both periods *L. smaragdi* flies were regularly observed swarming near a large fig tree and two large mulberry trees located 5–10 m south/southeast of the farm building. The foliage of one of the mulberry trees was in contact with that of the fig tree. Observations were made almost every day, usually during morning, noon and afternoon hours. Swarms were watched from a distance of 2–3 m and their location, shape, flight pattern, approximate number of swarming individuals and other relevant data were recorded.

Two swarms were daily formed in the free space between and beneath the branches of the fig tree and the mulberry trees, 1–3 m above the ground, 5–10 m apart one from the other and almost always in the sunshine. In addition to these two swarms, more *L. smaragdi* swarms were recorded in the same locality, at similar sites.

In several instances swarming flies were captured from the swarms by netting with a small insect net with 30 cm diameter. Of 33 specimens captured in

1981 on various occasions, only one was a female, while all 49 specimens captured in 1982 were males.

For most of the observation period of both years the weather was calm and the temperature ranged from 22° to 28 °C, but swarms were also observed in light to moderate wind. No swarms could be observed on two days with cloudy sky and on one day with strong wind.

The flies in the swarm moved extremely rapidly in a whirling, spiral-like flight pattern. The axis of the movement approximated the horizontal rather than the vertical plane. The overall shape of the swarms was rather elliptic, occupying a space of 1–2 m in diameter. Usually the swarms were more or less stationary. However, from time to time, they changed their location slightly, moving horizontally or vertically.

Occasionally, the typical swarming behavior changed for a short period: the swarm became much more compact and the flight speed of the individuals increased considerably. This change of behavior may be related to the entrance of a female into the swarm, though this was not verified. The fact that also a female was found among the specimens captured suggests that the swarming behavior in this species may be related with mating behaviour.

The number of individuals within each swarm was usually moderate (ca. 5–30) and varied from day to day and also in the course of the day. It was low early in the morning, increased around 08.00 to 10.00, diminished around noon, and increased again in the afternoon around 16.00 to 18.00. In some instances a single individual was observed flying with the peculiar swarming flight-pattern at the swarming sites, especially early in the morning and around noon. On August 19, 1982, observations at 06.00, 07.00, and 07.30 revealed no swarming activity. The first 2–3 individuals appeared swarming at 07.40. The swarm persisted throughout the day and disappeared by the time the sunrays ceased to fall on the swarming site at about 18.00. Similar swarming hours were also recorded on the other observation days.

The fact that the swarms were observed in practically the same sites between or near the branches of certain big trees and always in the sunlight, indicates that specific visual or other requirements determine the actual location where a *L. smaragdi* swarm is formed.

The above information on swarming behavior of *L. smaragdi* contributes to improved knowledge on the swarming behavior of Lonchaeidae already described for other species by McALPINE & MUNROE (1968). Much more research is needed, however, for understanding the biological significance of this behavior and the factors involved in its manifestation.

#### *Other Diptera observed swarming*

At the general site of the *L. smaragdi* swarms the following other Diptera were also observed:

*Silba adipata* McALPINE (Lonchaeidae): It was observed swarming only once, on August 20, 1982 at 17.00. The swarm occurred in a free space of 2 m between two large branches of a fig tree and consisted of ca. 20 individuals flying very rapidly in a pattern similar to that observed for *L. smaragdi*. The swarm danced mostly in the shade and was difficult to notice, because of the very rapid flight pattern and, in contrast to *L. smaragdi*, the absence of a shiny body. Of 8 specimens netted only one was a female.

*Delia platura* (MEIGEN) (Anthomyiidae): Observed on July 31, 1982 at about 17.00 beneath the branches of a mulberry tree on the east side, in the shade, over goosefoot plants (*Chenopodium sp.*). The swarm consisted of ca. 10–20 individuals swarming rapidly in a rather loose form occupying a space of ca. 1–2 m in diameter with its lower end 1–2 m above the ground. All of the five individuals netted were males.

*Phora sp.* (Phoridae): Swarms were observed almost daily during August and September 1981 and 1982, especially in the morning and afternoon hours. The swarms consisted of 4 up to about 50 individuals and were more or less stationary, the flies hovering usually above the edge of a mulberry branch or a grapevine shoot, near the terminal leaves exposed to the sun. All individuals were facing the terminal leaf and were spaced almost equally from one another, forming a compact swarm of usually 10–30 cm diameter. All 41 individuals netted on several days were males.

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#### ZUSAMMENFASSUNG

Schwärmende Männchen von *Lamprolonchaea smaragdi* (WALKER) (Diptera, Lonchaeidae) wurden im September 1981 auf der griechischen Insel Chios beobachtet. Die Insekten tanzten an Stellen, wo Sonnenstrahlen zwischen den Ästen von grossen Bäumen den Schatten durchdringen. Das Schwarmverhalten wird beschrieben. Auch Schwärme von *Silba adipata* McALPINE (Dipt., Lonchaeidae), *Delia platura* (MEIGEN) (Dipt., Anthomyiidae) und *Phora spec.* (Dipt., Phoridae) wurden am gleichen Ort beobachtet.

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