Fruit Fly Pests

Fruit flies (Diptera: Tephritidae) are serious crop pests in most areas of the world. Many species exist, with different host plant preferences and geographic distributions. Adults lay eggs in fruits and vegetables in which immature stages (maggots) feed, rendering the host unfit for consumption. Pest species are easily transported in maggot-infested produce, and they readily colonize new areas. Most nations enforce strict controls on importation of fruits and vegetables to prevent the spread of exotic fruit fly pests. Colonizing fruit fly populations are detected with traps baited with sex attractants or food lures.

The typical life history begins when eggs are laid into or under the skin of a fruit, where they hatch in 1-3 days. Larvae feed for 1-2 weeks, then exit the fruit to pupate in the soil. After 1-2 weeks the transformation from larva to adult is complete. New adult females need 1-2 weeks to become sexually mature and acquire the protein reserves needed to lay eggs; males develop to sexual maturity in one week or less. Development rates and activity levels of all life stages are temperature-dependent, becoming much slower at lower temperatures.

Caribbean Fruit Fly.

Maggot-infested fruit.

Jeffrey Lotz

Trap for collecting fruit flies.

Jack Kelly Clark

Mediterranean Fruit Fly

Ceratitis capitata (Wiedemann)

'Medfly' is considered the most serious of the world's fruit fly pests. It is an excellent colonizer with a broad host range and prolific breeding habits. Left uncontrolled, it can devastate many types of fruit crops.

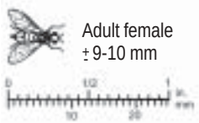
Hosts: At least 250 different fruits, nuts and vegetables are documented as Medfly hosts from field and laboratory data. Some important breeding hosts include citrus, stone fruits (peach, apricot, etc.), fig, guava, apple, loquat and mango. Many others may serve as major or minor hosts depending on ecological conditions; these include tomatoes, coffee, peppers, tropical almond, olives and prickly pear cactus. When in doubt, it is safest to assume that just about any fleshy fruit may be a host to Medfly!

Distribution: Medfly is a pest of the tropics and subtropics. It began to spread from its probable ancestral home in equatorial Africa in the early 1800s infesting first the countries surrounding the Mediterranean Sea, then later other regions of Africa, plus South America, Australia, Hawaii and Central America. It has spread more broadly than any other fruit fly pest.

Biology: Medfly breeds continuously when host fruits are available and temperatures are accommodating. For example, in warm, lowland Hawaii, the life cycle is less than 30 days, and more than 12 generations occur per year. Under optimal conditions, population growth may be explosive, as females are capable of producing 300-800+ eggs in their lifetime (often 2-3 months in the field) and population increases of over 100-fold per generation are possible. Females frequently lay batches of 1-14 eggs in a single fruit. Natural adult dispersal distances are small, normally much less than one mile. Males are attracted to Trimedlure, a synthetic sex attractant, over short distances, perhaps up to 100-200 meters. Larvae can jump.

Taxonomy: Medfly is the most widespread and pestiferous species of the genus *Ceratitis*. The genus comprises 78 species found in tropical and southern Africa. Another well-known pest in this group is the Natal fruit fly, *Ceratitis rosa*.

Jack Kelly Clark



Oriental Fruit Fly

Bactrocera dorsalis (Hendel)

Oriental fruit fly is a highly polyphagous pest whose larvae travel widely in infested fruit. It is an active disperser and a very aggressive breeder that can displace Medfly in some ecological zones.

Hosts: Over 100 host plants for Oriental fruit fly have been listed, including most types of commercial fruits, such as citrus, mango, peach, plum, apple, fig, banana and others. Additionally, it infests a wide variety of other agricultural products, such as coffee, chili pepper, watermelons, and also wild hosts. As with Medfly, it is not safe to rule out many plants as potential hosts.

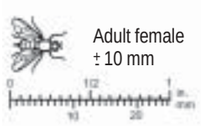
Distribution: Common from southern China to northern India; in Hawaii since 1945 and Guam since 1947. It is caught frequently in detection traps in California.

Biology: Oriental fruit fly breeds continuously in tropical conditions. Females are capable of producing 1200-1500 eggs in their lifetime (1-3+ months in the field), and population growth may be very rapid. Females lay batches of 1-20 eggs in a single fruit. Young males commonly

disperse over several miles before they attain sexual maturity. They are very strongly attracted to and actively imbibe methyl eugenol (ME), a sex attractant that occurs naturally in some tropical plants. If ME is laced with an insecticide and widely distributed at 'bait stations,' an invading population can be forced to extinction through 'male annihilation.' Larvae can jump.

Taxonomy: *B. dorsalis* is one member of the 'Oriental fruit fly complex' which includes more than 50 species that are very closely related and difficult to identify. The genus *Bactrocera* includes at least 450 species, many of which are pests of common commercial fruits. Another well-known of these pests is the Queensland fruit fly. Member species occur widely in Asia, Australia and the Pacific Islands.

Jack Kelly Clark



Melon Fly

Bactrocera cucurbitae (Coquillett)

Melon fly is the most destructive pest of melons and squashes in the Indo-Malayan region where it originated.

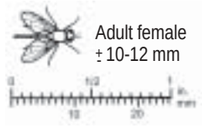
Hosts: Breeding hosts include major cucurbit crops such as cucumber, melons, squash, pumpkin and many types of gourds. Besides the fruit, it also attacks flowers, stems and roots. It can develop in many non-cucurbit plants, such as tomato, orange, mango, peach, avocado, garden bean and others, totaling 80 or more hosts.

Distribution: Widespread in India, throughout southeast Asia, Malaysia, Indonesia, Philippines, China and southern Japan. Also in East Africa, and islands of the Indian Ocean, New Guinea area, Hawaii and Guam.

Biology: Development time from egg to adult may be rapid — as little as 2 weeks. Adult lifespan in the field is typically 1-5 months, during which females may lay 300-1000 eggs. In Hawaii, 8-10 generations occur per year. Sexually mature males are strongly attracted to Cuelure, a synthetic sex attractant, and male annihilation may be useful in an eradication program. Larvae can jump.

Taxonomy: Melon fly is a member of the large subgenus *Zeugodacus* whose members are mostly associated with Cucurbitaceae hosts. In habits and appearance, they are very similar to species of the genus *Dacus,* which includes about 250 species, but are largely restricted to Africa.

Jack Kelly Clark



Mexican Fruit Fly

Anastrepha ludens (Loew)

'Mexfly' is the most serious fruit fly pest in Mexico because of its wide distribution there, broad host range and prolific breeding habits.

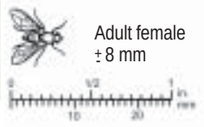
Hosts: A major pest of citrus, mango and peach. As grapefruit is one of Mexfly's preferred hosts, its economic impact in Florida could be very significant. It is a seed feeder in its native host, *Sargentia*, a citrus relative.

Distribution: Lower Rio Grande Valley of Texas south through Mexico and Central America to Costa Rica.

Biology: These are relatively large flies that are very long-lived, up to 11 months. Females may lay 1500 eggs in their lifetime. There are no artificial sex attractants available for detecting Mexfly. Detection is based on short-range attraction of female flies to protein-baited traps. Larvae cannot jump.

Taxonomy: There are about 200 species of the genus *Anastrepha*, and about 15 of these are major or minor pests. All are restricted to the Western Hemisphere, with various species ranging from Argentina to the southern United States.

Jeffrey Lotz



Caribbean Fruit Fly

Anastrepha suspensa (Loew)

'Caribfly' massively colonized southern Florida beginning in 1965 and has since spread to over 30 counties throughout south, central and eastern seaboard portions of the state. It is a relatively minor pest compared to other fruit flies, but still causes considerable aggravation to commercial fresh fruit exporters and residential fruit growers.

Hosts: Field infestations are known from about 80 different hosts in Florida, but only a few support large breeding populations. These include loquat, Surinam cherry, tropical almond, guava and rose-apple. Caribfly routinely attacks ripe citrus and mango, but damage is relatively small as typically only one or two larvae occur in each fruit.

Distribution: Islands of the Greater Antilles, and southern to central Florida.

Biology: The average life span of adult flies is about two months. Average fecundity is less than 200 eggs, much lower than that of its more serious pest relatives. Adults are present year round in Florida but with greatest abundance during April to July.

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Fruit Fly Pests

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