



FRUIT FLIES IN NEW CALEDONIA

Fruit flies (Diptera: Tephritidae) (Figures 1-4) are pest insects that lay their eggs under the skin of fruits (Figure 5). Eggs hatch into maggots (larvae) that feed on the fruit's flesh, causing extensive damage (Figure 6). Mature maggots leave the host fruit and burrow into the soil, where they change into puparia. Puparia are hard shells inside which the larvae gradually become adults. The development time, from egg to adult emergence from the puparium, may be as short as 20 days. Fruit flies are economically important because they directly damage fruits. Even one larva is enough to make a fruit unmarketable. Fruit flies also restrict the export of fruits to other countries. Of over 4500 described fruit fly species in the world, about 50 are major pest species, and 22 of them occur in the Pacific Islands region.

In New Caledonia, there are 12 fruit fly species, of which three are considered major pests. They may be sampled and monitored by setting up lure traps that attract male flies (using Cue-lure or methyl eugenol) and by collecting and holding suspected host fruits in containers over moist sawdust for two weeks.



Figure 1. Queensland fruit fly (*B. tryoni*).



Figure 2. *Bactrocera psidii*.



Figure 3. *Bactrocera curvipennis*.



Figure 4. Breadfruit fly (*Bactrocera umbrosa*).



NZODA



Figure 5. Fruit fly eggs inside fruit



Figure 6. Larvae inside tropical almond.

ECONOMICALLY IMPORTANT SPECIES

***Bactrocera tryoni* (Froggatt) (Queensland fruit fly)** (Figure 1) is the worst pest species in Australia, common across northern parts of the country and along the eastern coast south to Melbourne. In the Pacific, it was introduced into New Caledonia from Australia around or shortly before 1969. It was found in Tahiti, possibly introduced from New Caledonia, around 1970, and has spread over most French Polynesia, but not to the Marquesas. It also occurs on Pitcairn Island, probably introduced from French Polynesia. A polyphagous pest, this species has been recorded from 113 host species in Australia. In New Caledonia, it infests at least 24 host species (21 commercial/edible and 3 wild) in 20 genera and 15 families (Table 1). It is an aggressive species that has outcompeted and displaced *B. curvipennis* as the major pest species in New Caledonia and Mediterranean fruit fly (*Ceratitidis capitata* (Wiedemann) in New South Wales, Australia. Males are collected at Cue-lure traps. *B. tryoni* is distinguished from other New Caledonia species by the predominantly red-brown colour of dorsal part of its thorax and abdomen, and by the absence of transverse dark bands across the wings.

***Bactrocera psidii* (Froggatt)** (Figure 2), a species endemic to New Caledonia, is the second worst fruit fly pest in the Territory. It has been reared from 15 host species (11 commercial/edible and 4 wild) in 13 genera and 9 families (Table 1). However, its favourite host is guava. Males are attracted to Cue-lure. *B. psidii* can be recognised by its entirely black abdomen, the nearly colourless wings without dark cross bands, the yellow and black scutellum, and the lateral yellow bands (vittae) on the dorsal part of its thorax.

***Bactrocera curvipennis* (Froggatt)** (Figure 3) used to be New Caledonia's main pest species until the introduction of Queensland fruit fly. It is endemic to New Caledonia. It attacks 15 host species (14 commercial/edible and 1 wild) in 11 genera and 8 families (Table 1). Males are sampled with Cue-lure. This species can be easily identified by its black dorsal part of the thorax (with yellow lateral bands or vittae), its predominantly orange brown abdomen, and the short broad dark transverse band along r-m crossvein on the wing.

***Bactrocera umbrosa* (Fabricius) (Breadfruit fly)** (Figure 4) is widespread and very common over South-East Asia, Palau, Papua New Guinea, Solomon Islands, Vanuatu and New Caledonia, where it is most common along the northeast coast. Its host range is restricted to breadfruit (*Artocarpus altilis*) and jakfruit (*A. heterophyllus*). Males come to methyl eugenol traps. It is immediately recognised by the three large transverse bands on its wings.

***Bactrocera mucronis* (Drew)** is a minor pest restricted to New Caledonia and has been recorded from guava, tropical almond, and from *Cerbera manghas*. Males are attracted to Cue-lure. This species can be identified by the absence of dark cross bands on the wings, its black dorsal part of the thorax with short lateral yellow bands or vittae, and the orange-brown abdomen with dark lateral bands.

NON-PEST SPECIES

There are seven additional less common species of fruit flies, all restricted to New Caledonia, that breed on wild forest hosts. Species attracted to Cue-lure include *B. caledoniensis* (Drew), the dominant species on Maré, which breeds on *Merrenia tuberosa* and *Fagraea berteriana*; *B. aneuittata* (Drew), which breeds on *Tylophora* sp.; *B. fulvifacies* (Perkins), which attacks *Olea paniculata*; and *B. perpusilla* (Drew). Methyl eugenol traps collect *B. ebenea* (Drew), the dominant species on Lifou, and weakly attract *B. paraxanthodes* Drew and Hancock, a species bred from *Strobilopanax* sp. and *Schefflera gabriellae*. One species found only on Maré, *B. grandistylus* Drew and Hancock, is not attracted to male lure and can only be sampled by collecting its host fruits, *Diospyros fasciculosa*.

Table 1: Host plants of the pest fruit fly species in New Caledonia. Source: Amice, R., Sales, F. 1997. Fruit fly fauna in New Caledonia. Pp. 68-76 in: Allwood, A.J., Drew, R.A.I. 1997. Management of fruit flies in the Pacific. ACIAR Proceedings No. 76. 267pp.

COMMERCIAL/ EDIBLE HOSTS		<i>B. tryoni</i>	<i>B. curv- pennis</i>	<i>B. psidii</i>	<i>B. umbrosa</i>	<i>B. mucronis</i>
Avocado	<i>Persea americana</i>	X				
Banana	<i>Musa spp.</i>	X				
Bell pepper	<i>Capsicum annuum</i>	X	X			
Breadfruit	<i>Artocarpus altilis</i>				X	
Cashew	<i>Anacardium occidentale</i>	X	X	X		
Custard apple	<i>Annona reticulata</i>	X	X	X		
Grapefruit	<i>Citrus paradisi</i>	X	X			
Guava	<i>Psidium guajava</i>	X	X	X		X
Huesito	<i>Malpighia glabra</i>	X	X			
Indian jujube	<i>Zizyphus mauritiana</i>	X				
Jackfruit	<i>Artocarpus heterophyllus</i>	X			X	
Loquat	<i>Eriobotrya japonica</i>	X				
Malay apple	<i>Syzygium malaccense</i>	X	X	X		
Mandarin	<i>Citrus reticulata</i>	X	X			
Mango	<i>Mangifera indica</i>	X	X	X		
Pacific lychee	<i>Pometia pinnata</i>	X				
Peach	<i>Prunus persica</i>	X		X		
Pomelo	<i>Citrus grandis</i>	X	X	X		
Rose apple	<i>Syzygium jambos</i>	X	X	X		
Strawberry guava	<i>Psidium cattleianum</i>	X	X	X		
Surinam cherry	<i>Eugenia uniflora</i>	X	X	X		
Tropical almond	<i>Terminalia catappa</i>	X	X	X		X
WILD HOSTS						
	<i>Aleurites molluccana</i>			X		
	<i>Caryophyllus sp.</i>			X		
	<i>Cerbera manghas</i>					X
	<i>Diospyros macrocarpa</i>		X	X		
	<i>Ficus sp.</i>	X		X		
	<i>Hernandia cordigera</i>	X				
	<i>Morinda citrifolia</i>	X				

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