



# FRUIT FLIES IN VANUATU

Twelve species of fruit flies (Family Tephritidae: Sub-family Dacinae) have been recorded from trapping programmes and fruit surveys, conducted by the Vanuatu Government, Project on Regional Management of Fruit Flies in the Pacific and the ACIAR fruit fly project, since 1994. Despite this number of species, Vanuatu is in a very fortunate position with respect to its fruit fly status. None of the major world species have been recorded and the species that occur in Vanuatu are not as aggressive or damaging as many other species that occur in the Pacific region or elsewhere in the world. Eleven of the species belong to the genus *Bactrocera* and one to the genus *Dacus*. Eight of the species are well known to science, while three species are undescribed and are new to science. Only three species infest fruits that may be regarded as commercial or edible.



Figure 1. *Bactrocera trilineola*.



Figure 2. Breadfruit fly (*Bactrocera umbrosa*).



Figure 3. *Bactrocera quadrisetosa*.



Figure 4. *Bactrocera B. sp. nov. near paraxanthodes*



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## **Economically Important Fruit Fly Species**

The species that infest commercial or edible fruits are *Bactrocera trilineola* Drew, *B. umbrosa* (Fabricius) and *B. quadrisetosa* (Bezzi).

### ***Bactrocera trilineola*** (Figure 1)

*B. trilineola* is restricted to Vanuatu, but is widely distributed there. It occurs on all islands where trapping or fruit surveys have been done and probably occurs on most of Vanuatu's 80 islands. It has been recorded from 32 hosts, belonging to 18 plant families. Of the 32 recorded hosts, 22 are regarded as commercial or edible fruits. These include avocado, carambola, cashew, breadfruit, guava, lemon, kumquat, mango, Malay apple (*Syzygium malaccense*), orange, Pacific lychee (*Pometia pinnata*), papaya, plantain, pomelo, rose apple (*S. jambos*), soursop, Surinam cherry (*Eugenia uniflora*), Tahitian chestnut (*Inocarpus fagifer*) and tropical almond (*Terminalia catappa*). Guava suffers 95% infestation and it is expected that fruits such as Malay apple, rose apple and Surinam cherry suffer significant damage. Tahitian chestnut and tropical almond are heavily infested and contribute to the high populations of this species in Vanuatu, but damage is restricted to the flesh around the seed.

*B. trilineola* is similar to mango fly (*B. frauenfeldi*) and *B. caledoniensis*. It differs from them by having a glossy black face and no parallel yellow stripes on the dorsal surface of the thorax.

*B. trilineola* occurs at all times of the year, but tends to have population peaks in January-February and April-May, which coincide with the guava, mango and tropical almond fruiting times. It mates in the morning, which is different from many fruit fly species in the Pacific region. Male flies are attracted to Cue-lure.

### ***Bactrocera umbrosa* (Breadfruit Fly)** (Figure 2)

Breadfruit fly is a major pest of *Artocarpus* species, particularly breadfruit (*A. altilis*) and jakfruit (*A. heterophyllus*). It is widely distributed throughout Vanuatu, New Caledonia, Solomon Islands, Papua New Guinea and Palau in the Pacific region and South-East Asia. In Vanuatu, it has been recorded from breadfruit only.

*B. umbrosa* is a medium species and is easily recognized by its three broad red-brown transverse bands across the wings. The bands are red-brown. There is considerable variation in abdomen colour and markings between populations of *B. umbrosa* in the Pacific Island countries and territories.

### ***Bactrocera quadrisetosa*** (Figure 3)

*B. quadrisetosa* is a minor pest though it is widespread throughout its geographical range in Vanuatu. It is commonly recorded from only one host, Pacific lychee (*Pometia pinnata*). It is not attracted to any of the known male lures.

## **Non-pest Species**

Species of fruit flies that are not economically important include *Bactrocera anomala* (Drew), *B. calophylli* (Perkins and May), *B. gracilis* (Drew), *B. minuta* (Drew), *B. redunca* (Drew), *B. simulata* (Malloch), *B. sp. nov. near obscura*, *B. sp. nov. near paraxanthodes*, and *Dacus sp. nov.*

With the exception of *B. sp. nov. near paraxanthodes*, all of the non-economic species are attracted to Cue-lure. *B. sp. nov. near paraxanthodes* is like *B. quadrisetosa* in that it is not attracted to known male lures.

*B. gracilis*, a species attracted to Cue-lure, is present in Malakula, where it occurs in high populations, and in Esperitu Santo. *B. anomala* is recorded from *Pouteria grayana* (Sapotaceae). *B. calophylli* was thought to be a species near *B. calophylli*, but further host surveys and taxonomic studies have now determined that it is in fact *B. calophylli*. It is found on most islands. Its only known host is *Calophyllum inophyllum* (Clusiaceae).

*B. minuta* is a small species that is recorded throughout the archipelago and has been recorded from *Antiaris toxicaria* (Moraceae) and *Cerbera manghas* and *C. odollam* (Apocynaceae).

*B. redunca* is a medium species, and is also widespread throughout Vanuatu. It also occurs in Solomon Islands, Bougainville (PNG), New Britain (PNG), mainland PNG, and in several Torres Strait Islands (Saibai, Boigu and Yam). It is characterised by having an S-shaped band across the wing. Its only host is *Pycnarrhena ozantha* (Menispermaceae).

*B. simulata* is a large species whose males are attracted to Cue-lure. It occurs in Bougainville, Solomon Islands (Shortland Islands, New Georgia Island, Santa Cruz Islands and Guadalcanal), and Vanuatu. Although it was recorded as a minor pest of chilli in Santa Cruz Islands, it has not been recorded from any hosts in Vanuatu.

*B. sp. nov. near paraxanthodes* (Figure 4), as the name indicates, is a new species and is very similar in appearance to other members of the *xanthodes* complex of fruit flies. Like *B. paraxanthodes*, it is not attracted to male lures and has a limited host range, being restricted to *Barringtonia edulis* (Barringtoniaceae) and *Passiflorae suberosa* (Passifloraceae).

*B. sp. nov. near obscura* is a new species that is similar to *B. obscura* and *B. allwoodi*. It has a black dorsal surface on the thorax and an orange-brown abdomen. It is attracted to Cue-lure. No hosts have been recorded.

*Dacus sp. nov.* is a new species to science and is attracted to Cue-lure. Its only host is *Tylophora sp.*, which belongs to the plant family Asclepiadaceae, a group of plants, which contains many vine-type plants of semi-arid to arid origin.

### **Additional Reading**

Allwood, A.J., Tumukon, T., Tau, D. and Kassim, A. (1997) Fruit fly fauna in Vanuatu. In: 'Management of Fruit Flies in the Pacific', Eds Allwood, A.J. and Drew, R.A.I. ACIAR Proceedings No. 76, pp. 77-80.

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This leaflet was prepared by Allan Allwood, Chief Technical Advisor, FAO/AusAID/UNDP/SPC Project on Regional Management of Fruit Flies in the Pacific. Further information can be obtained from the FAO/AusAID/UNDP/SPC Fruit Fly Project, Secretariat of the Pacific Community, Private Mail Bag, Suva, Fiji. Photographs on Figures 1-2-4 taken by Steve Wilson and Figure 3 was drawn by Meredith Romig.

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Printed with financial assistance from UNDP, AusAID and the New Zealand Government.

Published by the Secretariat of the Pacific Community and printed by Quality Print Suva, Fiji. Further copies of this leaflet may be obtained from the **Secretariat of the Pacific Community, Plant Protection Service, Private Mail Bag, Suva, Fiji;** or from **Secretariat of the Pacific Community, BP D5, 98848 Nouméa Cedex, New Caledonia.**

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Secretariat of the Pacific Community Cataloguing-in-publication data

Allwood, Allan

Fruit flies in Vanuatu / by Allan Allwood.

(Pest Advisory Leaflet / Secretariat of the Pacific Community. Plant Protection Service; 27)

1. Fruit-flies 2. Diptera - Vanuatu 3. Tephritidae - Vanuatu  
I. Title II. Secretariat of the Pacific Community III. Series

634.049774

AACR2

Agdex 203 / 622

ISBN 982-203-731-7

ISSN 1017-6276