

## QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

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**LEPIDOPTEROUS PESTS OF THE LITCHI IN NORTH QUEENSLAND**

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**SUMMARY**

A list is given of 34 species of Lepidoptera feeding on litchi in northern Queensland, including notes on type of damage and months of activity. Records from outside of Australia are also reviewed.

**I. INTRODUCTION**

The litchi (*Litchi chinensis* Sonner, family Sapindaceae) is a subtropical fruit tree originating in China. In Australia, it is found from the New South Wales–Queensland border to Cairns in northern Queensland, mainly in residential gardens. However, the last few years have seen the development of a small litchi industry centred in the Cairns–Atherton Tableland region. By 1977, commercial plantings of around 5 000 trees with 24 growers had been established, with further expansion predicted (Anon, 1977). Cull and Hams (1974) give a thorough discussion of litchi growing in Queensland with descriptions of the tree and fruit.

In northern Queensland, the litchi is susceptible to attack from a variety of insect species. The larvae of various Lepidoptera are common, and since 1974 records have been kept of all species found damaging the tree and fruit. This paper is the result of the surveys and observations involved.

**II. METHODS AND MATERIALS**

Collection sites ranged from single trees to plantings of up to 200 trees. Sites were visited at intervals throughout the year and all lepidopterous larvae collected were reared to the adult stage in the laboratory for identification. Glass crystallizing dishes covered with a petri dish to prevent desiccation were the most suitable containers. Food material was replenished as necessary, and pupae were placed in small plastic containers until emergence of the adults. In fruit feeding species, the outer portion of the fruit was removed from the seeds to reduce fermentation and growth of moulds.

**III. RESULTS**

Table 1 shows the species identified, grouped according to family, locality, month in which they were found and the part of the tree damaged.

In respect of feeding behaviour, the species are divided into three categories: leaf, flower and fruit feeders. Each category is discussed separately. Some species were taken damaging leaves and flowers, or flowers and fruit, but no species were taken on both leaves and fruit, or on all three.

Only larvae which were successfully reared to the adult stage are included in the results because of the difficulties in identifying immature stages. Thus, some species, for example, *Achaea janata* (L) are more widespread than apparent in table 1, because of low survival levels of the reared larvae. Adult identifications were obtained for all specimens.

TABLE 1

## LEPIDOPTERA ATTACKING LITCHI IN NORTH QUEENSLAND

Locality Abbreviations: BAB: Babinda; BB: Bingal Bay; INFAL: Innisfail; ING: Ingham; JUL: Julatten; KAIRI: Kairi Research Station, Kairi; KAM: Kamerunga Research Station, Cairns; KUR: Koah Road, Kuranda; MAR: Mareeba; SO: Southedge Research Station, Mareeba; T: Tully; WALK: Walkamin Research Station, Walkamin; WR: White Rock, Cairns.

Family and Species	Localities	Months of Activity	Part of Plant Damaged
<b>Tortricidae</b>			
<i>Acropolitis canana</i> (Walker)	JUL	Nov.	Leaves
<i>Adoxophyes templana</i> .. (Pagenstecher)	WR	Nov.	Fruit
<i>Cryptophlebia ombrodelta</i> .. (Lower) .. .. .	ING, MAR, KAIRI, SO, WR	Sep., Nov., Dec.	Fruit
<i>Epiphyas postvittana</i> (Walker)	T	Sep.	Leaves
<i>Homona coffearia</i> (Nietner)	JUL	Sep.	Flowers
<i>Homona</i> sp. .. .. .	JUL	Sep.	Leaves
<i>Isotenes miserana</i> (Walker)	T, KAIRI, WALK, JUL, SO	Aug., Sep., Oct., Nov.	Leaves, flowers
<i>Lobesia physophora</i> Lower ..	WALK	Sep.	Flowers
<i>Lobesia</i> sp. 1 .. .. .	WR	Nov.	Fruit
<i>Lobesia</i> sp. 2 .. .. .	KAIRI, WALK, SO	Sep.	Flowers
<i>Merophyas divulsana</i> (Walker)	KAM, KAIRI	Jul.	Leaves, flowers
<i>Platyepplus aprobola</i> (Meyrick)	KAM, WALK, KUR, T	Jan., Mar., Jun., Jul., Sep.	Leaves, flowers
<b>Cosmopterigidae</b>			
<i>Pyroderces dendrophaga</i> (Meyrick)	KUR	Sep.	Fruit
<b>Gelechiidae</b>			
<i>Anarsia</i> sp. .. .. .	WR	Nov.	Fruit
<i>Hypatima ? baliodes</i> (Lower)	JUL	Sep.	Leaves
<i>Hypatima</i> sp. .. .. .	KAM, WALK	Jan., Jul., Mar.	Leaves
<b>Pyalidae</b>			
<i>Cateremna quadriguttella</i> Walker	WR, WALK	Mar., Nov., Dec.	Fruit
<i>Dichocrocis punctigeralis</i> (Guenée)	SO	Dec.	Fruit
<i>Homoeosoma vagella</i> Zeller	WR, MAR	Sep., Nov.,	Fruit, flowers
<i>Phycita leucomilta</i> Lower ..	SO, MAR, JUL	Sep. Nov.	Fruit, flowers
<i>Tirathaba rufivena</i> Walker ..	WR	Nov.	Fruit
<b>Lycaenidae</b>			
<i>Anthene lycaenoides godeffroyi</i> (Semper)	MAR	Aug.	Flowers
<i>Deudorix epijarbas dido</i> Waterhouse	JUL	Nov., Dec.	Fruit
<i>Prosotas dubiosa</i> (Semper) ..	MAR, SO	Aug., Sep.	Flowers
<i>Prosotas nora alutes</i> (Waterhouse and Lyell)	SO	Sep.	Flowers
<i>Rapala varuna simpsoni</i> (Miskin)	MAR	Aug.	Flowers

TABLE 1—continued

Family and Species	Localities	Months of Activity	Part of Plant Damaged
Geometridae <i>Gymnoscelis lophopus</i> Turner <i>Prasinocyma albicosta</i> (Walker)	KAIRI, SO WALK	Sep. Mar.	Flowers Leaves
Lymantriidae <i>Orgyia australis</i> Walker .. <i>Porthesia</i> sp. .. ..	WALK WALK	Aug. Apr., Aug.	Leaves Leaves
Noctuidae <i>Achaea janata</i> (L). . . . . <i>Eublemma versicolor</i> (Walker) <i>Hydrillodes lentalis</i> Guenée <i>Zalaca paurograpta</i> (Butler)	KUR SO WR SO, WALK, KAIRI, JUL	Mar. Sep., Nov. Nov. Sep., Nov., Mar.	Leaves Flowers, fruit Fruit Flowers

### Leaf feeders

Ten species were taken feeding on the foliage. Young growth is preferred with very little or no feeding apparent on older leaves. A few species, such as *A. janata*, feed openly on the leaves. Most, however, fold or roll one or more leaves together, fastening the edges with silk, thus forming a shelter. The larva then feeds on the leaves of this shelter, moving on to fresh leaves as necessary. Leaf feeders are active throughout the year.

The most widespread species were *A. janata*, *Isotenes miserana* (Walker), *Platyepplus aprobola* (Meyrick), and *Hypatima* spp.

### Flower feeders

The species which attack the flowers feed in a similar manner to leaf feeding species and some (for example, *I. miserana* and *P. aprobola*) have been found damaging both leaves and flowers. Each larva webs the florets of one or more flower spikes together, feeding from within this enclosure.

In northern Queensland, time of flowering varies with locality and also with tree variety. Flowering may occur from late June to late November, with flower feeding species active throughout this period.

The most common of the 15 species of flower feeders are *Phycita leucomilta* Lower, *Zalaca paurograpta* (Butler), and species of the genus *Lobesia*.

### Fruit feeders

Thirteen species have been taken feeding on the litchi fruit. All feed on the large seed contained within each fruit by burrowing through the outer edible flesh. This causes the fruit to drop if young, or makes it unmarketable. Other insects (for example, *Protaetia fusca* (Herbst) and *Xylotrupes gideon* L. (Coleoptera:Scarabaeidae)) are often attracted by the exudate of an infested fruit and can cause further damage to the clusters. At least one of the species recorded (*Deudorix epijarbas dido* Waterhouse) is capable of damaging several fruit during its lifetime, moving from one to another as the seed is partially or completely eaten out. The most common species is *Cryptophlebia ombrodelta* (Lower). *P. leucomilta* and *Homoeosoma vagella* Zeller feed on both the flowering and fruit stages.

In addition, damage typical of fruit sucking moths (*Othreis* spp. and other Noctuidae) has been observed on many occasions. As the species involved has not been determined the record has been omitted from table 1.

## IV. DISCUSSION

Table 2 lists all previous records obtained from the literature of Lepidoptera feeding on litchi. Five of these species were also recorded in this study and five more are different species of genera recorded in this study.

Many of the species recorded in Australia have been taken on other crops. The yellow peach moth *Dichocrocis punctiferalis* (Guenée), and the light brown apple moth, *Epiphyas postvittana* (Walker) are found on a variety of fruit and vegetable crops, while the lucerne leaf roller, *Merophyas divulsana* (Walker), is a pest of lucerne. *Homona coffearia* (Nietner), and the orange fruit borer, *I. miserana* are pests of citrus and a large number of pests of macadamia are recorded from litchi: macadamia flower caterpillar (*H. vagella*); macadamia nut borer (*C. ombrodelta*); *D. epijarbas*; *I. miserana*, *Cateremna quadriguttella* Walker; *Orgyia australis* Walker; *A. janata*; *Anarsia* sp; *Gymnoscelis lophopus* Turner; *P. aprobola*; *Lobesia* sp.; *Porthesia* sp. (Ironside, 1973 and unpublished D.P.I. records).

TABLE 2  
RECORDS OF LEPIDOPTERA ON LITCHI FROM OUTSIDE AUSTRALIA (FROM LITERATURE)

Family and Species	Locality	Source
Tortricidae		
<i>Adoxophyes cyrtosema</i> Meyrick ..	China .. ..	Liu (1958; 1964)
<i>Argyroplote leucaspis</i> Meyrick ..	China, India .. ..	Liu (1964)
		Mishra and Pandey (1965)
<i>Cacoecia tabescens</i> (Meyrick) ..	China .. ..	Liu (1964)
<i>Cryptophlebia illepada</i> (Butler) ..	USA (Hawaii) .. ..	Popenoe (1920)
<i>Cryptophlebia leucotreta</i> (Meyrick) ..	South Africa .. ..	Marloth (1947)
* <i>Cryptophlebia ombrodelta</i> (Lower) ..	China .. ..	Liu (1964)
	India .. ..	Popenoe (1920)
<i>Cryptophlebia peltastica</i> (Meyrick) ..	South Africa .. ..	Marloth (1947)
		Bradley (1952)
<i>Eboda cellerigera</i> Meyrick .. ..	China .. ..	Liu (1964)
* <i>Epiphyas postvittana</i> (Walker) ..	USA (Hawaii) .. ..	Higgins (1917)
* <i>Homona coffearia</i> (Nietner) .. ..	China .. ..	Liu (1964)
<i>Lobesia aeolopa</i> Meyrick .. ..	Taiwan .. ..	Sonan (1939)
<i>Platynota stultana</i> Walsingham ..	USA (Florida) .. ..	Dekle (1954 a; 1955)
* <i>Platyepplus aprobola</i> (Meyrick) ..	China .. ..	Liu (1964)
	India .. ..	Singh (1971)
Tineidae		
<i>Homosetia</i> sp. .. ..	USA (Florida) .. ..	Dekle (1954 b)
Gracillariidae		
<i>Acrocercops cramerella</i> Snellen ..	China .. ..	Chang (1961); Liu (1964)
Lycaenidae		
* <i>Deudorix epijarbas</i> Moore .. ..	China .. ..	Fullaway (1927); Djou (1938)
		Liu (1964)
<i>Virachola isocrates</i> F. .. ..	India .. ..	Pruthi (1936)
Geometridae		
<i>Racheospila gerularia</i> (Hubner) ..	USA (Florida) .. ..	Dekle (1954 a, 1955)
Saturniidae		
<i>Automeris</i> sp. .. ..	USA (Florida) .. ..	Dekle (1954b)
Notodontidae		
<i>Schizura opomeae</i> Doubleday ..	USA (Florida) .. ..	Dekle (1955)
Arctiidae		
<i>Utethesia bella</i> L. .. ..	USA (Florida) .. ..	Dekle (1954b)
Noctuidae		
<i>Plothia celtis</i> Moore .. ..	India .. ..	Popenoe (1970)

\* Species recorded from Australia in this survey.