QUEENSLAND HOST RECORDS FOR THE DACINAE (*fam.* Trypetidae).

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SUMMARY.

A comprehensive host list for the Dacinae occurring in Queensland has been compiled from data recorded following the collection of 350 species of cultivated, ornamental and wild fruits representing 75 botanical families. Records published by earlier authors and unpublished records from various sources are included.

Thirteen genera of Dacinae, with 39 species, are involved and arguments are given for the system of presentation of the genera. The status of certain species, particularly those forming the tryoni complex, needs some revision but deferring this question is not prejudicial to the form of presentation adopted in this paper. Several synonyms are recognized and these are discussed only in so far as they affect the purpose of this list. The recognition of food forms among several species has necessitated the sinking of many previously recognized varieties. The significance of these colour variants is discussed under the relevant species.

Strumeta tryoni (Frogg.), the most important economic fruit fly in Queensland, has been bred from 106 hosts.

Methods used in collecting, breeding, and cage rearing to facilitate identification of Dacinae are given.

The records, with suitable notes, are presented in two sections. The first is a list of fruit flies with their hosts. In the second, hosts are arranged alphabetically for family, genus and species. The species of Dacinae are tabulated under their respective hosts.

INTRODUCTION.

All species of the subfamily Dacinae (fam. Trypetidae) recorded in Queensland are indigenous, and although some of their native hosts are located in open forest or along watercourses, the majority are found in rain-forest. With the development of commercial fruit growing, several of these species have turned their attention to cultivated fruits, and three species—*Strumeta tryoni* (Frogg.), *S. musae* (Tryon) and *Austrodacus cucumis* (French)—have become important pests. The first-mentioned species is by far the most destructive, and due to its depredations, the growing of some fruits is not a commercial proposition in certain areas, while in others a reduction in the quantity of harvested fruit may be expected in most years.

Over the past 10 years, investigation of the fruit fly problem has been intensified, and one phase of the work has been the recording of the host fruits of the many species found in Queensland. Earlier workers in this State also devoted some time to this aspect of the problem, though a great many of their records were not published. During the current investigations, opportunity was found to check most of the earlier records.

Previous workers have covered most coastal and subcoastal regions in their search for host records, but during the course of these studies many new host records and several new fruit-fly species have been added to the already imposing list from within these areas. On the other hand, despite extensive search, several long recognized species have not been correlated with their native hosts, their presence in these parts of Queensland being recognized merely from specimens attracted to lure traps in commercial orchards.

Fruit fly trapping stations* established in widely separated and climatically diverse regions of the State and maintained for varying periods over the past 10 years have also revealed further new fruit fly species. Though the hosts of many of these species are not known, their fruiting season had been suggested by the trapping data. This information and consequent search have resulted in additions to the host list records.

The short-term collecting of hosts has been found unsatisfactory for a general study of fruit fly-host relationships. Many trees and shrubs may not fruit in a drought year. Furthermore, a fruit fly species may not be recovered from less susceptible hosts in a year when its numbers are low, unless large samples of fruits can be collected over a wide range of territory. Thus, older records may not be confirmed and newer ones established unless collecting is continued over many seasons. This host list, therefore, is by no means an exhaustive one and it is anticipated that further records will warrant supplementary lists.

During these investigations it became apparent that the many fruits collected could be divided roughly into three classes. The first includes those regularly infested by fruit fly larvae. The majority in this group are native fruits, including the only known host of a species, though many cultivated fruits when growing in certain districts could be included. A second and much larger group includes those fruits infested only under certain conditions, particularly the locality where the fruit was growing, the month when collected, fruit susceptibility and the effect of seasonal conditions on fly abundance. The majority of the host records presented fit into this group. Finally, there are those fruits that have never been associated with fruit fly infestation despite many collections from areas of known fly activity or in close proximity to infested fruits of well-known hosts. Some cultivated fruits, as well as a great many native ones, fit into this category. As examples, pineapples (*Ananas comosus* (L.) Merr.) and strawberries (*Fragaria indica* Andr.) are grown intensively throughout coastal districts where all fruit fly species

* These stations were established primarily to study dispersal and seasonal abundance.

recorded in Queensland are known to occur. Despite many collections by various investigators over the past 40 years, these two fruits have never been recorded as fruit fly hosts.

The records presented should be regarded purely as a host list. A large number of commercial hosts are listed under several fruit fly species, but these fruits are not always infested in the field and their inclusion merely shows that the species in question may breed in them occasionally.

Only field-collected hosts, naturally infested, have been used for these records. The inclusion of laboratory-infested material other than for a specific reason would be misleading.

METHODS.

Collecting and Breeding.

The greater portion of the field work covered by these studies was undertaken in the coastal and subcoastal regions between the Daintree River in North Queensland and the southern border of the State, particularly where rain-forest abounds. Only chance records were obtained west of the Dividing Range.

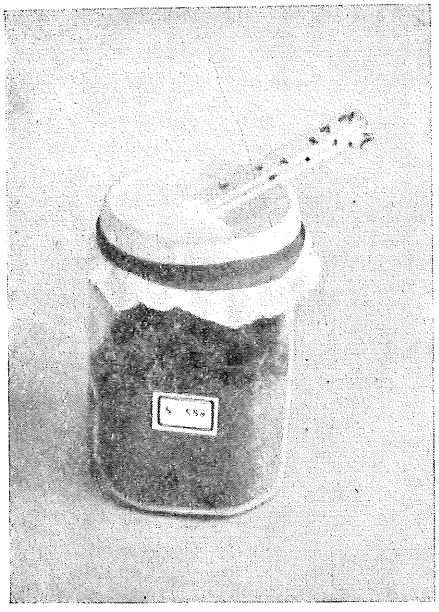
Since 1942, fruits representative of 75 botanical families and involving approximately 350 species have been collected. Some species were taken several times from the same locality as well as from various localities throughout the State.

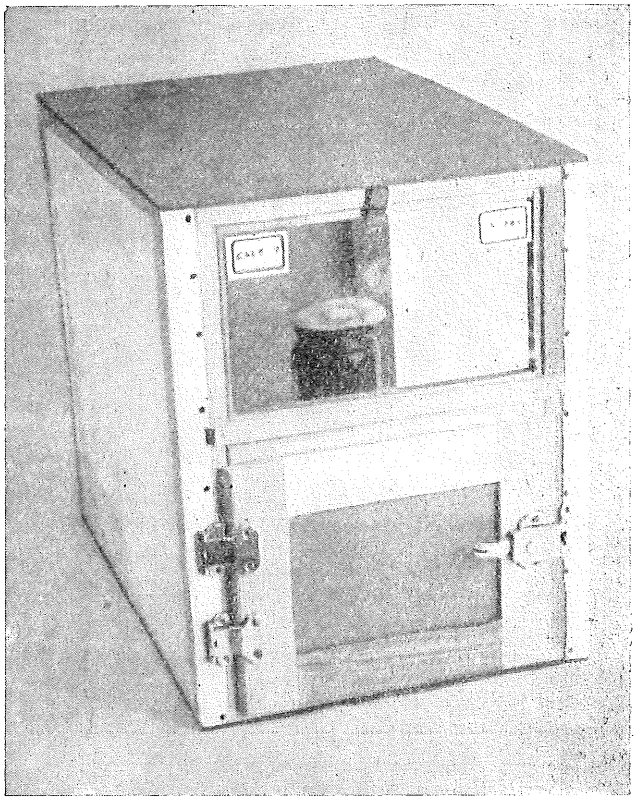
During field collecting, ripe fruits were gathered either directly from the tree or from the ground. Samples as large as possible were collected, and placed in stout brown-paper bags on which the locality, date and other relevant information was recorded. Similar species of fruit from different localities were always bagged separately.

In the laboratory, each sample was mixed with moistened sawdust, placed in a large glass jar suitably labelled, and covered with muslin or cheesecloth held in place with rubber bands. Each jar was fitted with a test tube inserted a short distance through a hole cut in the cloth cover. As the flies emerged* into the tube they were transferred to cages, and maintained with food for at least a month before being mounted. In this way, the flies developed normal colour patterns and tended to maintain normal shape and appearance after pinning. This made identification easier.

Two standard type cages were used, one measuring 18 in. x 12 in. x 15 in. and the other 36 in. x 15 in. x 15 in. Both were covered with muslin on three sides, and on the front with removable glass on each side of a wooden door. Pressed board or $\frac{3}{16}$ in. plywood covered both top and bottom.

* Over the years, parasites were often associated with fly infested fruits but did not interfere with this work. These records will be dealt with elsewhere.





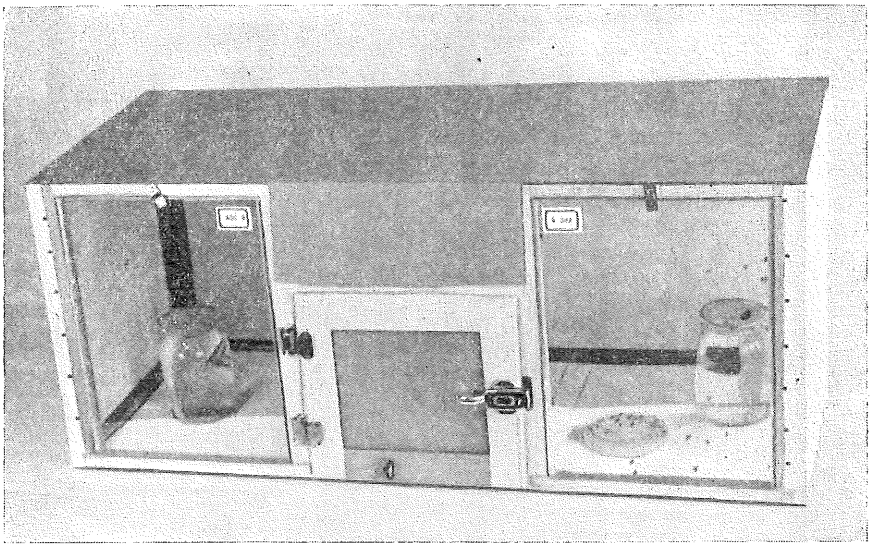


Fig. 1.

Apparatus for Collecting and Breeding Fruit Flies. Top left, emergence jar with muslin cover and tube fitted. Top right, smaller rearing cage. Bottom, larger rearing cage, showing water bottles and prepared food in petri dish.

Water was provided in each cage in 2 lb. glass jars fitted on top with 4 in. diameter circular pads of blotting paper from which a blotting paper wick hung into the water. Food consisted of (1) a prepared agar base medium containing brewer's yeast, sucrose, citric acid, fruit pulp and a mould preventive, (2) slices of apple or orange renewed every second or third day, and (3) honey smeared on small rectangles of glass which were removed, washed and replenished every second or third day.

Revision of Previous Records.

During the search for new records, every attempt was made to check those of earlier collectors. In some instances, closer settlement had resulted in the clearing of many rain-forest areas and with it the trees from which these records were established. On other occasions, when fruits were obtained they were not infested. There is the probability, however, that some of these unconfirmed records are valid and only results from repeated collecting over a number of years will substantiate them.

In compiling the host list, records additional to those obtained during the current investigations have been drawn from the published works of Froggatt (1909), Tryon (1927), Perkins (1934), Perkins and May (1949) and Hardy (1951). Further records have been obtained from examination of specimens in the fruit fly collections of the Queensland Department of Agriculture and Stock, the University of Queensland and the Queensland Museum. A revision of the determinations was often necessary in accordance with the present species concept.

Identification of Flies.

The species of Dacinae covered in this paper have been grouped according to the generic classification adopted by Perkins (1937) and added to by more recent workers. This classification may need revision*, but for the purpose of this paper it presents less likelihood of ambiguity than an entire subgeneric classification as presented by Hardy (1951).

Several synonyms have been established and these are discussed, as far as they concern this paper, under the relevant species. Some other species warrant further investigation but at this juncture (see footnote*) no attempt has been made to alter their present status. The existence of a number of closely related species, for convenience referred to as the *tryoni* complex, has also created some difficulty in presenting this host list.

Variations shown by laboratory-bred material were appreciated during these investigations. Abnormalities in chaetotaxy and size and in area and density of colour were noticed. These variations have been recognized by previous workers and in some instances have been considered a basis for varietal status. With field specimens these criteria are more uniform.

*A revision will be considered when current breeding and cytological studies are more advanced.

Tryon (1927) recognized varietal forms of *Strumeta tryoni* (Frogg.), *S. cacuminata* Hering, *S. musae* (Tryon) and *Afrodacus jarvisi* (Tryon). Laboratory breeding experiments* have now revealed that these are merely forms differing from the species in size and colour and the variations are attributable to food relationships during development within the host. Other species—*S. halfordiae* (Tryon), *S. pallidus* Perk. & May and *Austrodacus cucumis* (French)—also exhibit these colour forms among laboratory-reared and field-trapped material. The several forms are discussed further in the host list.

Botanical Identifications.

All botanical names, whether recent identifications or revisions, have been provided by officers of the Botany Section of the Department of Agriculture and Stock.

PRESENTATION OF DATA.

The records are presented in two sections.

The first section, more detailed than the second, lists the various host plants under each fruit fly species. The hosts are subdivided into wild, ornamental and commercial. The first include indigenous flora as well as those introduced plants well established in the wild state. Ornamentals include shrubs and trees cultivated for their ornamental value and which do not occur in the wild state. Commercial hosts include all vegetables, vines, shrubs and trees grown for commercial fruit production. Under each heading host names are arranged alphabetically according to family and genus. Where host names have been revised the names used in earlier host lists are indicated.

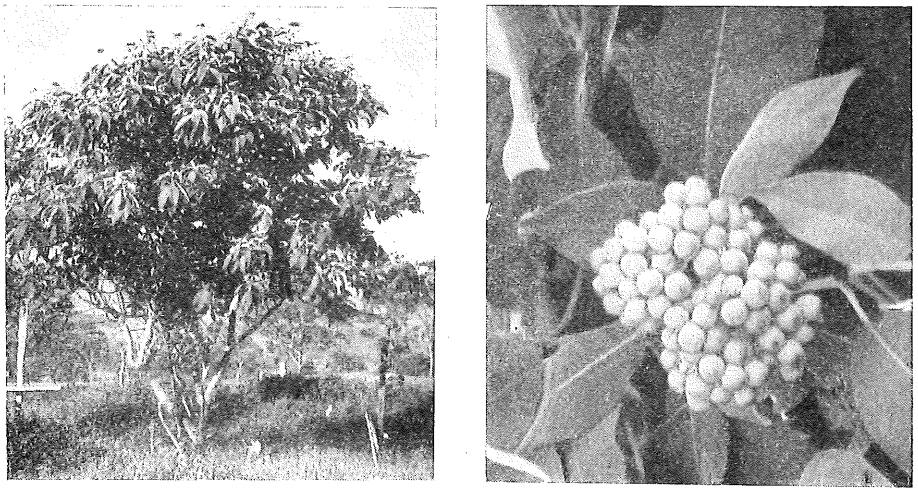


Fig. 2.
Solanum auriculatum Ait., Host of the Solanum Fly (*Strumeta cacuminata* Hering).

* Studies concerned with food requirements and colour variations are continuing.

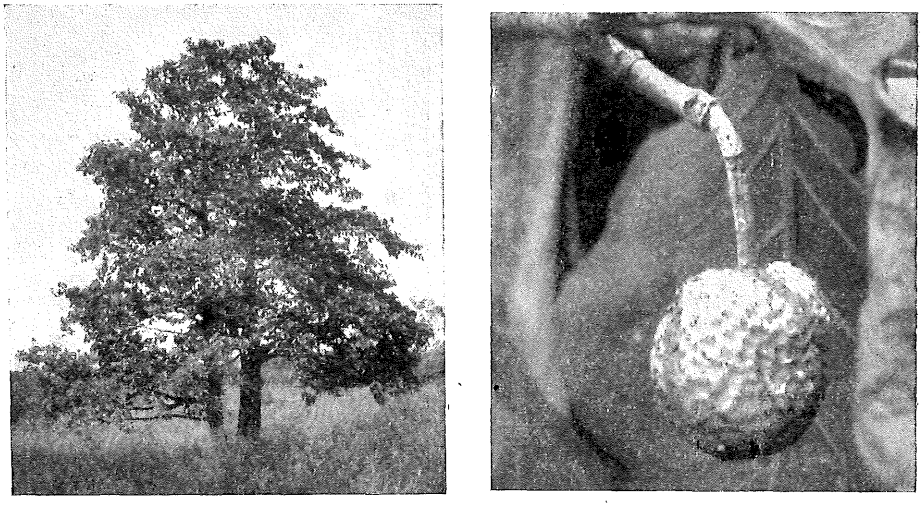


Fig. 3.
Nauclea orientalis L. (Leichhardt Tree or Canary Wood), the Only Known Host of *Strumeta pallidus* Perk. & May.

The order of presentation bears no relationship to host preferences. In general, susceptibilities of commercial host varieties to fruit fly attack are not discussed as these are dependent on several factors. There are, however, some instances that warrant discussion and these are given special mention.

All earlier records which have not been confirmed by the present author are marked by a symbol denoting the author of the record. Those considered doubtful for the species under which they were originally published are listed separately and discussed.

The key to the symbol notation is as follows:—

(T) = Tryon (1927).
(P) = Perkins (1934).
(P & M) = Perkins and May (1949).
(H) = Hardy (1951).
(DAS) = Dept. Agriculture and Stock Collection, Brisbane.
(UQ) = University of Queensland Collection.

The months of the year when fly attacks on each host were recorded are given. These data, however, are far from complete. To some extent fruiting period will vary with locality and seasonal conditions.

Those species for which host records are unknown are discussed under their respective genera.

In the second section, hosts are arranged alphabetically for family, genus and species. The species of fruit flies are tabulated under their respective hosts. In addition, concise relevant notes are given for appropriate records.

SECTION 1.

Fruit Fly–Host List.

Host records are arranged under the respective fruit fly species. This list contains records for 13 genera with 39 species.

AFRODACUS Bezzi.

Afrodacus jarvisi (Tryon).

= *Chaetodacus jarvisi* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 201-3.

C. jarvisi var. *careya* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): p. 202.

Dacus (*Chaetodacus*) *australis* Hendel 1928. Ent. Mitt.: 17 (5): pp. 341-2.

Laboratory breeding has shown that Tryon's var. *careya** is merely a melanic form of *A. jarvisi* which arises following a deficient food supply during the larval stages. These are small flies.

Commercial Hosts.

Ebenaceae.

Diospyros kaki L. f.—Persimmon: March.

Punicaceae.

Punica granatum L.—Pomegranate: April.

Rosaceae.

Cydonia oblonga Mill.—Quince: April (T).

Prunus armeniaca L.—Apricot: (T).

Prunus persica (L.) Batsch—Peach: March.

Pyrus communis L.—Pear: December and April.

This species will sting and breed readily in apples (*Malus sylvestris* Mill.) in the laboratory.

Wild Hosts.

Anacardiaceae.

Semecarpus australiensis Engl.—Tar tree: December (H). This host more usually supports the similarly coloured *Daculus murrayi* Perk. (see p. 46).

Barringtoniaceae.

Planchonia careya (F. Muell.) R. Knuth (= *Careya australis* F. Muell.) —Cockatoo apple: November to March. This host, found quite commonly in the coastal regions north from Bundaberg, breeds *A. jarvisi* in very large numbers each year.

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* Tryon (1927) has not commented on differences necessary to distinguish his var. *careya*, but merely refers to its existence as a type (Reg. No. Q.M.D. 3132) in the Queensland Museum.

Combretaceae.

Terminalia catappa L.—Tropical almond: (H).

Myrtaceae.

Eugenia cormiflora F. Muell.: December (H).

Psidium guajava L.—Guava: March to July—an important host in the northern regions of the State.

Males of this species are attracted in large numbers to the flowers of several plants, including *Bulbophyllum baileyi* F. Muell. (fam. *Orchidaceae*), *Passiflora ligularis* Juss. (fam. *Passifloraceae*) and *Semecarpus australiensis* Engl. (fam. *Anacardiaceae*), an association quite unrelated to the known host range of the species.

Afrodacus mesoniger May.

= *Afrodacus aberrans* Hardy 1951. Pacif. Sci. 5 (2): pp. 118-20.

Wild Hosts.

Lauraceae.

Litsea leefeana (F. Muell.) Merr. (= *Litsea ferruginea* (R.Br.) F. M. Bail.)—a Bollywood: December.

Litsea reticulata (Meissn.) Benth.—a Bollywood: December.

Neolitsea involucrata (Lam.) Alston (= *Litsea zeylanica* Nees.)—Grey bollywood: February.

Afrodacus brunneus Perk. & May and **A. tigrinus** May.

These two species have been recorded from lure traps only. To date repeated search has failed to reveal their hosts.

ASIADACUS Perk.

Asiadacus calophylli Perk. & May.

This species was placed in *Gymnodacus* Munro by Hardy (1951). Its true position is in some doubt, although there is evidence of a slight undulation at the end of the Cu_1 + 1A vein, suggesting very weak development of a supernumerary lobe.

Wild Host.

Guttiferae.

Calophyllum inophyllum L.—Calophyllum: July-September and February (P. & M.).

AUSTRODACUS Perk.

Austrodacus cucumis (French).

= *Dacus tryoni* Frogg. var. *cucumis* French 1907.
J. Dept. Agric. Vic. 5(5): p. 307.

Dacus cucumis French 1910. Proc. Linn. Soc. N.S.W. 35 (4): p. 886.

This species, commonly known as the cucumber fly, is a major pest of cucurbits, tomatoes, and papaws, particularly in the northern areas of Queensland. Though sound fruits are stung, fruits that have been allowed to ripen in the field, become sunburnt, or damaged by other means, are readily attacked. Oviposition in young fruits of many cultivated cucurbits causes malformation and stunting.

Commercial Hosts.

Caricaceae.

Carica papaya L.—Papaw: September.

Cucurbitaceae.

Cucurbita pepo L.—Pumpkin: Winter, spring and early summer—more usually associated with damaged fruits or fruits in early stages of development.

Cucurbita pepo L. var. *medullosa* Alef.—Marrow: (T)—damaging fruit especially when newly formed.

Cucurbita pepo L. var. *melopepo* Alef.—Squash: Winter, spring and early summer (DAS). Fruits in early stages of development are often damaged.

Cucumis melo L.—Rock melon: chiefly associated with ripe or sunburnt fruits.

Cucumis sativus L.—Cucumber: Winter, spring and early summer—a major pest of this crop in North Queensland and may deposit eggs in newly formed fruits, causing malformation and stunting.

Sechium edule Sw.—Choko: Summer. Females seen to oviposit in developing fruits. Larval development in this fruit has not been established.

Solanaceae.

Lycopersicon esculentum Mill.—Tomato: Spring and early summer. More usually ripened fruits or those exhibiting growth cracks or mechanical injury are stung. When sound fruits are attacked, the eggs are generally deposited at the calyx end.

Wild Hosts.

Cucurbitaceae.

Bryonopsis laciniosa (L.) Naud. (= *Bryonia laciniosa* L.)—Native bryony: May, July and November—associated with this host more particularly in North Queensland.

Momordica charantia L.—Chinese bitter cucumber or balsam pear: June.

Euphorbiaceae.

Glochidion harveyanum Domin: (H). This record has not been confirmed and seems quite unrelated to the more usual behaviour of this species.

CALLANTRA Walk.
= *Mellesis* Bezzi 1916.

Callantra aequalis (Coq.).
= *Dacus aequalis* Coq. 1909. Proc. Linn. Soc. N.S.W. 33 (4): pp. 794-5.

Though this species has been taken quite commonly for many years in lure traps in southern Queensland, its native host has not been recorded. Froggatt (1909) bred this fly from orange (*Citrus sinensis* Osbeck) at Gosford, N.S.W., and the specimens furnished the material for Coquillet's description. However, no additional records of this species having been bred from either cultivated or native hosts can be found.

DACULUS Speis.
Daculus murrayi Perk.
Wild Host.

Anacardiaceae.

Semecarpus australiensis Engl.—Tar tree: December-January—fruits usually heavily infested.

Fig. 4.
Fruit of *Psidium guajava* L., a Common Host for Several Species of *Dacinae*.

DIPLODACUS May.

This genus was erected from a large series of specimens to accommodate the only known species listed below. Variation occurs in the degree of development of the secondary scutellar bristles and some specimens appear to fit into the genus *Daculus**. However, though inconspicuous, these bristles can be seen quite readily under magnification. The majority of specimens show these bristles well developed.

Diplodacus signatifer (Tryon).

= *Dacus signatifer* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14) : pp. 210-11.

Wild Host.

Capparidaceae.

† *Capparis lucida* (DC.) R. Br. ex Benth.: December to April. Fruits can generally be found on this shrub at most periods of the year.

HETERODACULUS Hardy.

Heterodaculus visendus Hardy.

Wild Host.

Guttiferae.

Garcinia kajewskii C. T. White—a Native mangosteen: January (H).

MELANODACUS Perk.

Melanodacus niger (Tryon).

= *Dacus niger* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14) : pp. 211-12.

Wild Hosts.

Icacinaceae.

Gomphandra australiana F. Muell.: August.

Oleaceae.

Olea paniculata R. Br.—Native olive: August.

Symplocaceae.

Symplocos thwaitesii F. Muell.: (T).

NEODACUS Perk.

Neodacus newmani Perk.

Though described from north-western Australia, where it was bred from native fruits, this species has been taken in lure traps at Toowoomba and Stanthorpe. No host records are available.

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* Hardy (1951) discussed *D. signatifer* under the genus *Daculus*.

† Tryon (1927) wrongly listed this host as *Capparis laurifolia* R. Br.

NEOZEUGODACUS May.

= *Hemizeugodacus* Hardy 1951. Pacif. Sci. 5 (2): p. 131.

Neozeugodacus algaiae (Hardy).

Wild Hosts.

Meliaceae.

Aglaia ferruginea White & Francis: November (H).

Aglaia sapindina (F. Muell.) Harms (= *Hearnia sapindina* F. Muell.): February (H).

Neozeugodacus aureus May.

Wild Host.

Alangiaceae.

Alangium villosum (Bl.) Wangerin subsp. *tomentosum* (F. Muell.) Bloemb. var. *australe* Bloemb. (= *Marlea vitiensis* Auct.)—Muskwood: February.

PARATRIDACUS Shiraki.

Paratridacus expandens (Walk.).

=*Dacus expandens* Walk. 1859. Proc. Linn. Soc. London 3: p. 114.

Bactrocera garciniae Bezzi 1913. Mem. Ind. Mus. 3: pp. 97-8.

Dacus yayeyamanus Matsumura 1916. Thousand Insects of Japan, Addit. 2: p. 412.

Ornamental Host.

Guttiferae.

Garcinia tinctoria (DC.) W. F. Wight: May (UQ) and August-November (H).

STRUMETA Walk.

= *Dasyneura* Saunders 1841 (nec. Rondani 1840).
Chaetodacus Bezzi 1913.
Marquesadacus Mall. 1932.

Strumeta alyxiae May.

Wild Host.

Apocynaceae.

Alyxia spicata R. Br.—a Chain-fruit: August.

Strumeta bancroftii (Tryon).

= *Chaetodacus bancroftii* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 199-201.

Wild Host.

Moraceae.

Cudrania javanensis Trécul.—Indian cockspur: December-February. The fruit of this host is always heavily infested.

Strumeta barringtoniae (Tryon).

= *Chaetodacus barringtoniae* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 196-7.

Wild Host.

Barringtoniaceae.

Barringtonia calyptrata R. Br.—a Barringtonia: February (UQ) and (T)—fruits usually heavily infested.

Strumeta bilineata Perk. & May.

= *Dacus* (*Strumeta*) *mayi* Hardy 1951. Pacif. Sci. 5 (2): pp. 161-2.

Commercial Host.

Rosaceae.

Prunus armeniaca L.—Apricot: November—only very occasional specimens bred in certain years.

Wild Hosts.

Sapotaceae.

Planchonella australis (R. Br.) Pierre (= *Sideroxylon australe* (R. Br.) F. M. Bail.)—Black apple: November (UQ).

Planchonella obovata (R. Br.) H. J. Lam: August-September.

Planchonella pohlmaniana (F. Muell.) Pierre ex Dubard (= *Sideroxylon pohlmanianum* (F. Muell.) F. M. Bail.)—Yellow boxwood: November (DAS).

Combretaceae.

Terminalia muelleri Benth.: August (UQ). This record has not been confirmed, though several collections of this host were made during July-August.

Strumeta breviaculeus Hardy.

Wild Hosts.

Euphorbiaceae.

Glochidion harveyanum Domin: August and December (H).

Myrtaceae.

Psidium guajava L.—Guava: April (H). The correct identification of the flies associated with this record is in some doubt (*vide* Hardy, 1951, pp. 147-8).

Strumeta bryoniae (Tryon).

= *Chaetodacus bryoniae* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 192-3.

Wild Hosts.

Cucurbitaceae.

Bryonopsis laciniosa (L.) Naud. (= *Bryonia laciniosa* L.)—Native bryony: November to May (Sth. Qld.) and May-August (Nth. Qld.). This is the more usual host for this species and within the periods mentioned the fruits are always heavily infested.

Melothria cunninghamii (F. Muell.) Benth.—a Native cucurbit: March. Mostly small flies are bred from this host.

Melothria maderaspatana (L.) Cogn. (= *Mukia scabrella* Arn.): April.

Passifloraceae.

Passiflora foetida L.—Stinking passion vine: June (Nth. Qld.)

Passiflora suberosa L.—Small-flowered passion vine: June-July (Nth. Qld.) (UQ).

Strumeta cacuminata Hering.

= *Chaetodacus dorsalis* Tryon, nec. Hendel, 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 194-6.

Chaetodacus dorsalis var. *major* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): p. 195.

Strumeta solani Perk. & May 1949. Univ. Qld. Dept. Biol. 2 (14): pp. 14-16.

This species, more commonly referred to as the Solanum fly, was for some time confused with *S. dorsalis* (Hendel), and most of the earlier host records for the species in Queensland are published under this name.

Considerable variation, in both size and colour, is found when a large series of specimens of *S. cacuminata* is examined. Individuals segregated according to the extent of black pigmentation on the thorax show an inverse correlation between size and area of pigmentation. Tryon's var. *major** is a large form exhibiting a minimum of black on the dorsum. At the other end of the scale are individuals almost wholly black on the mesonotum. Such variation is due entirely to food relationships during the larval state and the entire range of forms may be bred from a single collection of host fruits.

Commercial Hosts.

Solanaceae.

Capsicum frutescens L.—Chili: (T)—an unconfirmed record, suggesting that this is an occasional host.

* Tryon did not publish a description of this variety but merely referred to a type in the Queensland Museum (Reg. No. Q.M.D. 3126).

Capsicum frutescens L. var. *grossum* L. H. Bail.—Giant capsicum: (T).

Lycopersicon esculentum Mill.—Tomato: November—only a few specimens bred on one occasion.

Wild Hosts.

Solanaceae.

Solanum auriculatum Ait.—Wild tobacco: Summer and autumn (Sth. Qld.); winter, spring and early summer (Nth. Qld.). The fruits are generally heavily infested.

Solanum seaforthianum Andr.—Brazilian nightshade: February (Sth. Qld.) (DAS); August (Nth. Qld.) (UQ). Only a few specimens were bred in both instances. This host was collected on several occasions but these records were not confirmed. Large numbers of *S. tryoni* food forms were bred from this host (see p. 69).

Solanum verbascifolium L.—Wild tobacco. This host is heavily infested. The fruiting period is similar to that of *S. auriculatum*.

Hardy (1951) records this species from *Rhipogonum papuanum* C. T. White (fam. *Smilacaceae*), but states that it is a possible error (vide Hardy, 1951, p. 152).

Strumeta endiandrae Perk. & May.

Wild Hosts.

Annonaceae.

Cananga odorata (Lam.) Hook. f. & Thoms.—Ylang-ylang: May (UQ).

Lauraceae.

Beilschmiedia obtusifolia (F. Muell.) F. Muell.—Blush walnut: November (H). These fruits were collected on several occasions but this record was not confirmed.

Cryptocarya erythroxylon Maid. & Betche—Southern maple: July-September (Nth. Qld.) (P & M); November (Sth. Qld.) (UQ).

Endiandra discolor Benth.—Rose walnut: August-October. These fruits are generally heavily infested.

Endiandra sp: December. This undetermined species from Mount Tamborine (Sth. Qld.) was heavily infested.

Litsea leefeana (F. Muell.) Merr.—a Bollywood: November (H). The somewhat similarly coloured *Afrodacus mesoniger* May is the only species that has been bred from this host in southern Queensland. Hardy's record was established on the Atherton Tableland, Nth. Qld.

Strumeta fagraea (Tryon).

= *Chaetodacus fagraea* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 188-90.

Wild Hosts.

Loganiaceae.

Fagraea cambageana Domin: June-September—the fruits are heavily infested.

Fagraea muelleri Benth.: June-October—also supports this species in large numbers.

Myrtaceae.

Eugenia sp. (near *suborbicularis* Benth.): September (H).

Strumeta fuscatus Perk. & May.

= *Dacus* (*Strumeta*) *laticaudus* Hardy 1950. Proc. Hawaii. Ent. Soc. 14 (1): pp. 87-9.

Wild Hosts.

Combretaceae.

Terminalia muelleri Benth.: August (UQ). Despite several collections of this host, this record has not been confirmed.

Euphorbiaceae.

Glochidion ferdinandii Muell. Arg.: August (UQ).

Sapotaceae.

Planchonella obovata (R. Br.) H. J. Lam: July-September. Most fruit is infested.

Strumeta halfordiae (Tryon).

= *Chaetodacus halfordiae* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 190-1.

Chaetodacus gurneyi Perk. 1934. Proc. Roy. Soc. Qld. 45 (9): pp. 41-2.

This synonymy was established after a close check of type material and the examination of series of specimens bred from *Halfordia kendack* (Montr.) Guillaum. (= *H. drupifera* F. Muell.) from the type locality, and hosts of *S. gurneyi*. Tryon (1927) admits describing this species from teneral material and failed to note the brown colouration on the scutellum.

Many host records rightly belonging to this species have been ascribed in the past to *S. tryoni* (Frogg.). Superficially these two species are somewhat similar. Though *S. halfordiae* is relatively common in lure traps at certain times of the year and can be bred from several hosts, both cultivated and

wild, only one host, *H. kendack,* was recorded by Tryon (1927). No doubt many records for this species were included by this author among his host list for *S. tryoni* (Tryon, 1927, pp. 184-5). Four hosts in Tryon's list—*Acronychia laevis* Forst., *Ficus glomerata* Willd., *Planchonella australis* (R.Br.) Pierre (= *Sideroxylon australe* (R.Br.) F. M. Bail.) and *Rauwenhoffia leichhardtii* (F. Muell.) Diels (= *Melodorum leichhardtii* (F. Muell.) Benth.) —are usually infested by *S. halfordiae.*

This is one of the species that exhibits considerable variation within a series of specimens bred from the same host. Variation occurs in the size and shape of the facial spots, the extent of brown colouration on the scutellum, the intensity of markings on the mesonotum and abdominal tergites and the length of the lateral post sutural stripes. Some specimens tend towards the general characters for *S. kraussi* Hardy, and the possible relationship between these two species is discussed on page 56.

Commercial Hosts.

Rosaceae.

Eriobotrya japonica (Thunb.) Lindl.—Loquat: September—occurs quite commonly in this host in coastal areas.

Rutaceae.

Citrus paradisi Macf.—Grapefruit: Autumn. Appreciable numbers have been bred from this host in the Nambour-Palmwoods area.

Citrus reticulata Blanco—Mandarin: Spring—occasional specimens only.

Citrus sinensis Osbeck—Orange: Autumn. This host is attacked occasionally in coastal areas.

Fortunella japonica (Thunb.) Swingle—Kumquat: December. Occasional specimens may be recorded among large numbers of *S. tryoni.*

Ornamental Hosts.

Myrtaceae.

Eugenia uniflora L.—Brazilian cherry: December—occasional specimens among large numbers of *S. tryoni.*

Feijoa sellowiana Berg—Feijoa: February—occasional specimens among large numbers of *S. tryoni.*

Wild Hosts.

Annonaceae.

Rauwenhoffia leichhardtii (F. Muell.) Diels (= *Melodorum leichhardtii* (F. Muell.) Benth.): February-May—frequently bred in large numbers, with occasional *S. tryoni,* from this fruit.

Moraceae.

Ficus glomerata Willd.—a Cluster fig: May (P)—associated with *S. tryoni.*

Myrtaceae.

Eugenia corynantha F. Muell.—Sour cherry: October-December—usually in association with *S. tryoni.*

Rutaceae.

Acronychia laevis Forst.: April. Always associated with this host and the fruit may be heavily infested.

Halfordia kendack (Montr.) Guillaum. (= *Halfordia drupifera* F. Muell.)—Saffron heart: September.

Sapotaceae.

Niemeyera chartacea (F. M. Bail.) C. T. White (= *Lucuma chartacea* F. M. Bail.): December—may be heavily infested.

Planchonella australis (R. Br.) Pierre (= *Sideroxylon australe* (R. Br.) F. M. Bail.)—Black apple: November-December—commonly associated with this fruit.

Strumeta humeralis (Perk.).

= *Chaetodacus humeralis* Perk. 1934. Proc. Roy. Soc. Qld. 45 (9): pp. 42-3.

Dacus tryoni var. *neohumeralis* Hardy 1951. Pacif. Sci. 5 (2): pp. 169-70.

Though readily distinguished from *S. tryoni* (Frogg.) on colour characters, *S. humeralis* is closely related to this species in its host range, seasonal abundance and general morphological characters. The status of this fly is at present under investigation, but from the information available it would seem that it may well be a variety of *tryoni,* as suggested by Hardy (1951).

This fly may be bred in very large numbers from certain of its hosts and at times may be the only fly to emerge. It is more abundant in the northern areas of the State, where it may heavily infest guava (*Psidium guajava* L.) and species of *Citrus.* More usually, it occurs in association with *S. tryoni,* this being the dominant species.

Commercial Hosts.

Anacardiaceae.

Mangifera indica L.—Mango: Very occasional specimens are obtained among numbers of *S. tryoni.*

Moraceae.

Morus nigra L.—Black mulberry.

Rosaceae.

Eriobotrya japonica (Thunb.) Lindl.—Loquat: Spring—commonly associated with this fruit.

Malus sylvestris Mill.—Apple.

Prunus armeniaca L.—Apricot.

Prunus domestica L.—Plum.

Prunus persica (L.) Batsch—Peach.

Pyrus communis L.—Pear: Occasional specimens among large numbers of *S. tryoni* were bred during spring and summer months.

Rubiaceae.

Coffea arabica L.—Coffee.

Rutaceae.

Citrus sinensis Osbeck—Orange.

Citrus grandis Osbeck—Pomelo or shaddock.

Citrus limon Burm. f.—Lemon.

Citrus paradisi Macf.—Grapefruit.

Citrus reticulata Blanco—Mandarin.

Fortunella japonica (Thunb.) Swingle—Kumquat.

Most species of *Citrus* may be stung by this fly whenever fruit is approaching the ripe state. Lemons, other than the variety Meyer, are only attacked when the fruits have been allowed to ripen on the tree or are lying on the ground as ripened windfalls.

Solanaceae.

Cyphomandra betacea Sendt.—Tree tomato: This is the only species bred from these fruits.

Lycopersicon esculentum Mill.—Tomato: It occurs in association with *S. tryoni*.

Ornamental Hosts.

Anacardiaceae.

Spondias cytherea Sonn.—Vi apple or hog plum.

Myrtaceae.

Eugenia uniflora L.—Brazilian cherry: September-December.

Feijoa sellowiana Berg—Feijoa: February.

Both these hosts are commonly infested with occasional individuals among large numbers of *S. tryoni*.

Psidium cattleianum Sabine—Cherry guava.

Wild Hosts.

Capparidaceae.

Capparis lucida (DC.) R. Br. ex Benth.: January (H). Though several collections of this fruit were made, this record was not confirmed.

Combretaceae.

Terminalia melanocarpa F. Muell.: August—occasional specimens among large numbers of *S. tryoni.*

Lauraceae.

Cryptocarya erythroxylon Maid. & Betche—Southern maple: September (UQ).

Endiandra compressa C. T. White—Queensland greenheart: February (UQ).

Myrtaceae.

Psidium guajava L.—Guava. This host is commonly infested by *humeralis,* particularly in North Queensland.

Passifloraceae.

Passiflora alba Link & Otto—White passion fruit: February to May—common in this host.

Passiflora suberosa L.—Small-flowered passion vine: June and July (Nth. Qld.) (P)—frequently associated with this host.

Rutaceae.

Clausena brevistyla Oliv.: February (H).

Sapindaceae.

Ganophyllum falcatum Bl.: January (H).

Sapotaceae.

Niemeyera chartacea (F. M. Bail.) C. T. White (= *Lucuma chartacea* F. M. Bail.): December.

Planchonella obovata (R. Br.) H. J. Lam: September (UQ).

Solanaceae.

Solanum laciniatum Ait. (= *S. aviculare* auct. austr.)—Kangaroo apple: Late summer (DAS).

Solanum seaforthianum Andr.—Brazilian nightshade: April.

Further search should reveal many more hosts for this fly. The expanded list of hosts, no doubt, will include many already recorded for *S. tryoni.*

Strumeta kraussi Hardy.

This species resembles *S. halfordiae* in many respects and is only separated on colour differences and the length of the ovipositor. A comparison of the hosts of the two species suggests some relationship. However, the zones of distribution differ in that *S. halfordiae* has been found only in southern Queensland and *S. kraussi* in North Queensland.

Ornamental Hosts.

Apocynaceae.

Thevetia peruviana (Pers.) Schum.—Yellow oleander: February (H). This record has not been confirmed.

Myrtaceae.

Syzygium branderhorstii Lauterb.: January and February (H). Hardy (1951) recorded this host as *Eugenia branderhorstii.*

Wild Hosts.

Annonaceae.

Cananga odorata (Lam.) Hook. f. & Thoms.—Ylang-ylang: July (UQ).

Cunoniaceae.

Schizomeria whitei J. Mattf.—Northern white birch: January and February (H).

Icacinaceae.

Irvingbaileya australis (C. T. White) Howard: February (UQ).

Lauraceae.

Endiandra compressa C. T. White—Queensland greenheart: November and March (H).

Endiandra discolor Benth.—Rose walnut: August—occasional specimens among large numbers of *S. endiandrae.*

Endiandra palmerstonii (F. M. Bail.) White and Francis: April (DAS) and August (UQ).

Myrtaceae.

Acmena macrocarpa C. T. White: June and July—bred in very large numbers.

Eugenia australis Wendl. ex Link—Creek lilly pilly: August (UQ).

Eugenia cormiflora F. Muell.: July and December (H).

Eugenia luehmannii F. Muell.—Small-leaved water gum: January and February (H).

Eugenia suborbicularis Benth.: August (H).

Eugenia tierneyana F. Muell.: January and February (H).

Psidium guajava L.—Guava: March and June (H).

Rhodomyrtus macrocarpa Benth.—Finger cherry: November (H).

Rutaceae.

Acronychia acidula F. Muell.—Scrub lemon: June to August—not recorded in very large numbers.

Sapindaceae.

Arytera sp. (?) : September (H).

Castanospora alphandii (F. Muell.) F. Muell.: December (H)—*S. tryoni* bred from the same fruits.

Thymelaeaceae.

Phaleria clerodendron (F. Muell.) F. Muell. ex Benth.: April (DAS).

Strumeta melas Perk. & May.

There seems little doubt that *melas* should be classed as, at most, a variety of *tryoni*. Laboratory studies are at present under way to establish this point. Whereas *humeralis* differs from *tryoni* in having a dark brown or black humeral callus and in the colour pattern as well as the intensity of colour on both the thorax and abdomen, *melas* differs only in the intensity of black colouration on the thorax and is possibly only a melanic form. In size it compares with fully developed specimens of *tryoni*. Its commercial host range follows that of both *tryoni* and *humeralis,* though it has been bred from only one indigenous host.

Commercial Hosts.

Rosaceae.

Eriobotrya japonica (Thunb.) Lindl.—Loquat.

Malus sylvestris Mill.—Apple.

Prunus domestica L.—Plum.

Pyrus communis L.—Pear.

Only occasional specimens among large numbers of *S. tryoni* were bred from these hosts.

Rutaceae.

Citrus paradisi Macf.—Grapefruit: Autumn—occasional specimens.

Fortunella japonica (Thunb.) Swingle—Kumquat: Occasional specimens were found.

Wild Hosts.

Myrtaceae.

Psidium guajava L.—Guava: March (Nth. Qld.)—a very occasional specimen among a large series of *S. tryoni* and *S. humeralis.*

Passiflora alba Link & Otto—White passion fruit: January and February —more commonly bred than *S. tryoni* from this host.

Strumeta musae (Tryon).

= *Chaetodacus musae* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 197-9.

C. musae var. *dorso-picta* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): p. 198.

Considerable variation may exist, among newly emerged flies, in the extent of black pigmentation on the mesonotum. Some specimens possess an extensive reddish-brown pattern on the dorsum interspersed with areas of black pigmentation similar to that described by Tryon for his variety *dorso-picta**. With age, the intensity and extent of black pigmentation increases. Field specimens of *musae* are almost wholly black on the mesonotum.

This fly is confined to regions north of Cardwell, North Queensland, where it is an important pest of cultivated bananas. Unlike *S. tryoni,* it may sting fruit in the green state. It has never been recorded in the banana-growing areas of southern Queensland.

Commercial Hosts.

Musaceae.

Musa nana Lour.—Mons Mari, Cavendish and other dwarf banana varieties: These fruits are infested from June to August and January and February.

Musa paradisiaca L. var. *sapientum* (L.) Kuntze—Sweet plantain banana: August (UQ).

Wild Hosts.

Musaceae.

Musa banksii F. Muell.—a Native banana: June to September and February and March. Very large numbers of flies may be bred from this host.

The following, concerning families other than Musaceae, were recorded by Hardy (1951) as hosts of this well known species. Only one or two specimens were bred in each instance. These records have not been confirmed and it is suggested that they are in error as they are not consistent with the normal behaviour of this species.

Commercial Host.

Caricaceae.

Carica papaya L.—Papaw: February (H).

Wild Hosts.

Capparidaceae.

Capparis lucida (DC.) R.Br. ex Benth.: January (H).

Myrtaceae.

Psidium guajava L.—Guava: April (H).

Strumeta mutabilis May.

Though relatively common in lure traps in southern Queensland during spring and early summer, no indigenous hosts have been located.

Commercial Host.

Rutaceae.

Fortunella japonica (Thunb.) Swingle—Kumquat: December. One specimen was bred among a large series of *S. tryoni.*

* Tryon (1927) described his variety *dorso-picta* in a footnote on p. 198.

Strumeta notatagena May.

This fly has been taken only in traps in the Cairns area.

Strumeta pallidus Perk. & May.

Atypical forms of this species are found among bred and field-trapped material. These food forms exhibit varying intensities of black markings on the thorax and abdomen, though never to a marked degree.

Wild Host.

Rubiaceae.

Nauclea orientalis L. (= *Sarcocephalus cordatus* Miq.)—Leichhardt tree or canary wood: March to May. Large populations breed in these fruits during the autumn months, though the occasional fruit produced during the spring may be infested.

Strumeta pulcher (Tryon).

= *Bactrocera pulcher* Tryon 1927. Proc. Roy. Soc. Qld. 45 (9): pp. 206-7.

Specimens of *S. pulcher* have been trapped in the Nambour-Palmwoods area, close to the type locality, but no host has been located in southern Queensland. Hardy (1951) records one specimen bred from the fruits of *Planchonella* sp. collected near Atherton, North Queensland, in September.

Strumeta recurrens Hering.

= *Strumeta manskii* Perk. & May 1949. Univ. Qld. Dept. Biol. 2 (14): pp. 3-5.

Though the types have not been compared, Hering's description of *recurrens* differs from *manskii* only in colour densities on thorax and abdomen. The characteristic wing markings and other distinguishing characters establish this synonymy.

Wild Host.

Loganiaceae.

Strychnos bancroftiana F. M. Bail.: July to November (Nth. Qld.).

Strumeta strigatus (Perk.).

= *Chaetodacus strigatus* Perk. 1934. Proc. Roy. Soc. Qld. 45 (9): pp. 43-4.

This species was described from trapped material. Frequently it has been recovered from traps in the Gayndah, Gatton and Stanthorpe districts but search has failed to reveal host fruits.

Strumeta tryoni (Frogg.).

= *Tephritis tryoni* Frogg. 1897. Agric. Gaz. N.S.W. 8: pp. 410-12.

Chaetodacus tryoni var. *musa* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): pp. 187-8.

C. tryoni var. *juglandis* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): p. 188.

C. tryoni var. *sarcocephali* Tryon 1927. Proc. Roy. Soc. Qld. 38 (14): p. 188.

The several varietal forms recognised by Tryon (1927) have been recovered among specimens bred from their type hosts. Laboratory studies of this and related material have demonstrated that *juglandis* and *sarcocephali* are merely forms of *tryoni* which develop following abnormal food supply during the larval state*. Both forms were recovered frequently among flies bred from hosts of *tryoni,* a wide range of food forms emerging from hosts considered unsuitable for normal larval development. The variety *juglandis* represents only one stage in the range of forms that may occur among a series of flies bred from Tryon's type host, walnut (*Juglans regia* L.). It is extremely variable and intergrades with *sarcocephali* towards one end of the scale and with *tryoni* at the other. Typical *tryoni,* however, are seldom bred from this host.

A series of specimens bred from walnut and exhibiting variation due to food deficiencies can be arranged according to the extent of black colouration on the mesonotum. As the extent of the black pattern increases, the mean size of individuals within each group decreases. The extreme is a small fly intensely marked with dark brown or black on the thorax as well as on the second abdominal tergite. The density of these markings increases with age. Such specimens conform to the markings of Tryon's variety *sarcocephali.*

It is significant that many other species show these food forms among both laboratory-bred and field-trapped material. In all instances, an intensification of colour in the subcutaneous layers in certain regions of the thorax and abdomen is associated with a general decrease in body measurement.

Tryon's var. *musa,* bred from cultivated dwarf bananas (*Musa nana* Lour.), does not conform to the pattern exhibited by the two forms already discussed. Still another type of variation is found in material bred from mango (*Mangifera indica* L.). In many respects these two forms are lighter in colour, larger and generally atypical of the normal *tryoni.* As Tryon (1927) states, however, in his account of the form *musa,* "their general facies" are "difficult to define in words." Though obviously representing food forms of the species, these have not necessarily arisen due to deficiencies in the food supply.

* See also footnote p. 41.

Considerable variation, generally of a minor character, is obvious when a large series of *tryoni* is examined critically. Though superficially similar, closer examination will reveal colour and size differences covering a wide range of forms. Among the many flies examined during these studies, two outstanding conditions were noted. Firstly, certain commercial hosts gave rise to exceptionally large specimens, all more or less uniform for general colour and an absence of black markings. Flies from both cultivated banana and mango fall within this group. Secondly, for many commercial hosts and a large proportion of the wild hosts recorded, "dark" forms were prevalent and the flies were, on the whole, much smaller than usual. Those individuals exhibiting the extreme in black pigmentation on the thorax were generally small and in most instances died soon after emergence. These, also, were among the last flies to emerge from the sample.

Commercial Hosts.

Anacardiaceae.

Anacardium occidentale L.—Cashew: (T).

Mangifera indica L.—Mango: This host gives rise to large specimens. There is a wide variation in susceptibility depending on both mango variety and locality. The least fibrous varieties are more subject to attack. Fruit will also be stung and develop larvae after it has fallen to the ground.

Annonaceae.

Annona reticulata L.—Bullock's-heart: (H).

Annona squamosa L.—Custard apple: This is not an important host but may be damaged in certain seasons.

Caricaceae.

Carica papaya L.—Papaw: This fruit will be attacked during summer months if allowed to ripen on the tree.

Ebenaceae.

Diospyros kaki L. f.—Persimmon: Though this fruit may be heavily stung when it ripens in late summer and early autumn, a large percentage of the "stings" fail to develop. The fruits, however, are spoilt for commercial purposes. Obviously the texture of the pericarp is unsuitable for larval development.

Juglandaceae.

Juglans regia L.—Walnut: As mentioned earlier, these fruits are readily attacked but give rise to small flies showing extreme variation in colour.

Lauraceae.

Persea gratissima Gaertn. f.—Avocado: April.

Moraceae.

Ficus carica L.—Fig: Infestation is not usual in this host. It can occur, however, should the receptacle split, particularly following wet weather. Flies seem unable to oviposit through the skin of the receptacle, though eggs may be placed directly into the orifice of ripe fruit.

Morus alba L.—White mulberry: (T).

Morus nigra L.—Black mulberry.

Mulberries are commonly infested though only one or two larvae may be located in each fruit. The greater part of larval development takes place after the fruit have fallen to the ground. Large specimens are bred from this host.

Musaceae.

Musa nana Lour.—Mons Mari and Cavendish bananas: Unlike *S. musae,* which may sting these fruit while still quite immature, *S. tryoni* will only oviposit in fruit allowed to colour on the bunch. Normal methods of harvesting prevent losses from the latter pest.

Oleaceae.

Olea europaea L.—Olive: (T). These fruits are not usually infested.

Oxalidaceae.

Averrhoa carambola L.—Carambola or five corner: These fruits are commonly infested.

Palmae.

Phoenix dactylifera L.—Date palm. These fruits are cultivated in inland areas where populations of *S. tryoni* are seldom large. Infestation may occur though it is never severe. Fully developed larvae may pupate within the fruit, suggesting that they are unable to escape through the tough skin. When the plant is grown as an ornamental in coastal districts, its fruit may become heavily infested.

Passifloraceae.

Passiflora edulis Sims—Passion fruit: Though maggot development is exceedingly rare in these fruits, considerable crop damage may occur due to extensive oviposition in newly formed fruits. Oviposition punctures, seen as oval, raised, calloused areas in the skin, cause premature fruit fall.

Passiflora quadrangularis L.—Granadilla: Fruits are frequently stung when approaching the mature state. Larval development proceeds normally.

Punicaceae.

Punica granatum L.—Pomegranate: Infestation is usually associated with fruit that have split when ripe.

Rosaceae.

Cydonia oblonga Mill. (= *C. vulgaris* Pers.)—Quince: These fruits are often heavily stung while still in a very immature state. Normal larval development is apparently restricted, and small flies exhibiting a considerable range of food forms are bred from this host.

Eriobotrya japonica (Thunb.) Lindl.—Loquat: These fruits are usually heavily infested.

Malus sylvestris Mill. (= *Pyrus malus* L.)—Apple.

Prunus armeniaca L.—Apricot.

Prunus avium L.—Cherry.

Prunus domestica L.—Plum.

Prunus persica (L.) Batsch—Peach.

Prunus persica (L.) Batsch var. *nectarina* (Ait.) Maxim.—Nectarine.

Pyrus communis L.—Pear.

The above pome and stone fruits are readily stung by *S. tryoni* and rarely escape damage in areas where fruit fly is active. Certain early-maturing varieties of apricot, cherry and peach may escape damage in districts where spring temperatures are sufficiently low to retard ovarian development among the overwintering fly population.

Rubiaceae.

Coffea arabica L.—Coffee: Occasional fruits may be stung.

Rutaceae.

Citrus sinensis Osbeck—Orange.

Citrus grandis Osbeck (= *C. decumana* L.)—Pomelo or shaddock.

Citrus limon Burm. f.—Lemon: Lemons, except the variety Meyer, which may be attacked while in the green or semi-ripe state, are never stung unless allowed to ripen fully on the tree. Fallen fruit that have ripened on the ground may be stung and the larvae will develop to maturity.

Citrus medica L.—Citron: This is not an important host and only an occasional ripened fruit is stung, giving rise to food forms.

Citrus paradisi Macf.—Grapefruit: This fruit is very subject to attack as it ripens in many districts when populations are large. However, it is not unusual, as with other species of *Citrus,* to find that larvae fail to hatch though egglaying may have been heavy. On dissection, it is found that a layer of corky tissue has been formed around each egglaying puncture. Also, the inroads of blue-green moulds (*Penicillium* spp.) following egglaying punctures will often destroy the hatched larvae.

Citrus reticulata Blanco—Mandarin.

Fortunella japonica (Thunb.) Swingle—Kumquat.

Solanaceae.

Capsicum frutescens L. var. *grossum* L. H. Bail.—Giant capsicum: Food forms may be associated with this host.

Lycopersicon esculentum Mill.—Tomato: These fruits are attacked readily during the summer months, particularly following periods of wet weather or if the fruits are allowed to ripen on the plant. Flies bred from this host are usually of a large size and food forms are rarely encountered.

Physalis peruviana L.—Cape gooseberry (DAS): Food forms are bred from this host.

Vitaceae.

Vitis labruscana L. H. Bail.—Isabella grape (probably is *V. labrusa* L. x *V. vinifera* L.).

Vitis vinifera L.—European varieties of cultivated grape and wine grapes.

Grapes are more usually stung in years of large fly populations when egglaying may be intensive. Though larvae do not always develop to maturity, the fruit may be lost from secondary causes. Form *sarcocephali* is found among bred material.

Ornamental Hosts.

Anacardiaceae.

Spondias cytherea Sonn.—Vi apple or hog plum.

Cactaceae.

Opuntia ficus-indica Mill.—Indian fig: (T).

Flacourtiaceae.

Dovyalis caffra (Harv. & Sond.) Warb. (= *Aberia caffra* Harv. & Sond.)—Kei apple.

Flacourtia jangomas (Lour.) Miq. (= *F. cataphracta* Roxb.): (T).

Myrtaceae.

Eugenia jambos L.: December (H).

Eugenia uniflora L.—Brazilian cherry.

Feijoa sellowiana Berg—Feijoa.

Psidium cattleianum Sabine—Cherry guava.

These last three myrtaceous hosts are usually heavily infested.

Rutaceae.

Aegle marmelos Correa—Bael fruit: (T).

Wild Hosts.

Anacardiaceae.

Pleiogynium cerasiferum (F. Muell.) Domin—Burdekin plum: December —not an important host.

Annonaceae.

Polyalthia nitidissima (Dun.) Benth.—Canary beech: March (H)

Polyalthia sp.: January (UQ).

Rauwenhoffia leichhardtii (F. Muell.) Diels. (= *Melodorum leichhardtii* (F. Muell.) Benth.): November to May. This host is more frequently infested by *S. halfordiae* (see p. 53).

Apocynaceae.

Alyxia ruscifolia R. Br.—a Chain-fruit: December. Only an occasional food form was bred from these fruits.

Carissa ovata R. Br.—Currant bush: February (UQ). Though fruits were collected on several occasions, this record was not confirmed.

Ochrosia elliptica Labill.: (T).

Capparidaceae.

Capparis lucida (DC.) R. Br. ex Benth.: February (H).

Capparis mitchellii Lindl.—a Native pomegranate: January (UQ).

Capparis nobilis (Endl.) F. Muell. ex Benth.—a Native pomegranate: (T).

Though fruits of these three species of *Capparis* were collected on several occasions, none of the records were confirmed. Apparently these are not important hosts.

Celastraceae.

Elaeodendron australe Vent.: (T).

Siphonodon australe Benth.—Ivorywood: January.

Combretaceae.

Terminalia catappa L.—Tropical almond: February (H).

Terminalia melanocarpa F. Muell.: August.

Terminalia muelleri Benth.: July to September.

Melanic food forms are commonly bred from these hosts.

Cunoniaceae.

Davidsonia pruriens F. Muell.—Davidsonian plum: (T). Several collections of fruits failed to confirm this record.

Schizomeria ovata D. Don—White birch: (T).

Ebenaceae.

Diospyros australis (R. Br.) F. M. Bail.: (T).

Euphorbiaceae.

Glochidion ferdinandii Muell. Arg.: August (UQ). Food forms have been recovered from this host.

Hemicyclia australasica Muell. Arg.—Grey boxwood or yellow tulip: December to February. A complete range of food forms has been bred from these fruits.

Lauraceae.

Beilschmiedia obtusifolia (F. Muell.) F. Muell.—Blush walnut: November (H).

Cryptocarya erythroxylon Maid. & Betche—Southern maple: September (UQ).

Endiandra compressa C. T. White—Queensland greenheart: (T).

Endiandra discolor Benth.—Rose walnut: October (UQ).

Endiandra sp. (indet.): December.

Meliaceae.

Aglaia sapindina (F. Muell.) Harms (=*Hearnia sapindina* F. Muell): November (H).

Owenia venosa F. Muell.—Crow's apple: December (UQ). These fruit are rarely attacked by this species.

Moraceae.

Cudrania javanensis Trécul.—Indian cockspur: January and February.

Ficus glomerata Willd.—a Cluster fig: May (T).

Ficus macrophylla Desf.—Moreton Bay fig: December—infested very occasionally.

Ficus watkinsiana F. M. Bail.: (T). Several collections of these fruits have been made but this record has not been confirmed. Tryon (1927, p. 184) questions his own record and suggests that it may be *F. stephanocarpa* Warb. However, fruits of that species have never yielded *S. tryoni*.

Myrtaceae.

Eugenia australis Wendl. ex Link—Creek lilly pilly: July (UQ).

Eugenia cormiflora F. Muell.: December (H).

Eugenia corynantha F. Muell.—Sour cherry: December.

Eugenia smithii Poir.—Lilly pilly: (T).

Eugenia suborbicularis Benth.: August (H).

Psidium guajava L.—Guava: Though food forms may be recovered from infested material, these are due to larval competition and not to the unsuitability of the host for larval development.

Rhodamnia sessiliflora Benth.: March (H).

Oleaceae.

Notelaea longifolia Vent.: (T).

Passifloraceae.

Passiflora alba Link & Otto—White passion fruit: February.

Passiflora aurantia Forst.: (T).

Rhamnaceae.

Dallachya vitiensis (Seem.) F. Muell.: January (H).

Zizyphus mauritiana Lam.—Chinee apple: July—not heavily infested and gives rise chiefly to food forms.

Rosaceae.

Rubus fruticosus L.—Blackberry: February and March. Large flies were bred from these fruits, which are an important host in some areas.

Rubiaceae.

Nauclea orientalis L. (=*Sarcocephalus cordatus* Miq.)—Leichhardt tree or canary wood: October and May (T). Form *sarcocephali* was first recovered from this host.

Rutaceae.

Eremocitrus glauca (Lindl.) Swingle (=*Atalantia glauca* (Lindl.) Hook. f.)—Lime bush: (T).

Sapindaceae.

Castanospora alphandii F. Muell.: December (H).

Ganophyllum falcatum Bl.: February (H).

Sapotaceae.

Amorphospermum antilogum F. Muell. (=*Lucuma amorphosperma* F. M. Bail.)—Brown pearwood: December (H).

Mimusops elengi L.: December (H).

Niemeyera chartacea (F. M. Bail.) C. T. White (=*Lucuma chartacea* F. M. Bail.): December.

Planchonella australis (R. Br.) Pierre (=*Sideroxylon australe* (R. Br.) F. M. Bail.)—Black apple: November and December.

Planchonella pohlmaniana (F. Muell.) Pierre ex Dubard (= *Sideroxylon pohlmanianum* (F. Muell.) F. M. Bail.)—Yellow boxwood: (T).

Most sapotaceous fruits are infested by more than one species of Dacinae, and *S. tryoni,* if present, is usually in relatively small numbers.

Smilacaceae.

Rhipogonum papuanum C. T. White: November (H). This is an unusual record for *S. tryoni* and was not confirmed.

Solanaceae.

Solanum auriculatum Ait.—Wild tobacco: November (H).

Solanum laciniatum Ait. (=*S. aviculare* auct. austr.)—Kangaroo apple: Summer.

Solanum seaforthianum Andr.—Brazilian nightshade: March and April —melanic food forms are usually bred from these fruits.

Vitaceae.

Cissus antarctica Vent.: May (UQ). These fruits have been collected on several occasions but this record was not confirmed. This is, no doubt, an unimportant host.

The following are considered doubtful records:—

Cucurbitaceae.

Bryonopsis laciniosa (L.) Naud. (=*Bryonia laciniosa* L.)—Native bryony: (T). Despite numerous collections of this host from all parts of the State, this record has not been confirmed. Such a host does not conform to the habits of *S. tryoni*.

Rutaceae.

Acronychia laevis Forst.: (T). This is an important host of *S. halfordiae* (see p. 54). More recent collectors have been unable to confirm Tryon's original record.

Sapindaceae.

Atalaya hemiglauca (F. Muell.) F. Muell. ex Benth.—Whitewood: (T). This tree produces winged fruits with a minimum of pericarp. It is debatable whether it could support fruit fly larvae. Perhaps this was recorded in error for *Atalantia glauca* (=*Eremocitrus glauca*).

ZEUGODACUS Hendel.

Zeugodacus atrisetosus Perk.

Wild Host.

Meliaceae.

Aglaia sapindina (F. Muell.) Harms (= *Hearnia sapindina* F. Muell.): July and August (P & M).

Zeugodacus synnephes (Hendel).

= *Dacus synnephes* Hendel 1913. Ent. Mitt., 2: 40.

Bactrocera caudatus Tryon, nec. Fabr., 1927.

Proc. Roy. Soc. Qld. 38 (14): 203-6.

Wild Host.

Cucurbitaceae.

Bryonopsis laciniosa (L.) Naud. (= *Bryonia laciniosa* L.)—Native bryony: April to July. This species is not abundant in this host.

SECTION 2.

Host—Fruit Fly List.

In the following list, the recorded hosts of species of the subfamily Dacinae occurring in Queensland are presented alphabetically under their respective botanical families. The fruit fly species known or reported to breed in each host plant are given. Where necessary, relevant remarks or comments on the authenticity or importance of the record are given in the final column.

Botanical Name.	Common Name.	Species Recorded.	Remarks.
ALANGIACEAE			
Alangium villosum (Bl.) Wangerin subsp. *tomentosum* (F. Muell.) Bloemb. var. *australe* Bloemb.	Muskwood ..	*Neozeugodacus aureus*	
ANACARDIACEAE			
Anacardium occidentale L...	Cashew ..	*Strumeta tryoni* ..	
Mangifera indica L. ..	Mango	*Strumeta tryoni* ..	
		Strumeta humeralis..	Occasional specimens.
Pleiogynium cerasiferum (F. Muell.) Domin	Burdekin plum	*Strumeta tryoni* ..	Not usually infested.
Semecarpus australiensis Engl.	Tar tree ..	*Daculus murrayi* ..	
		Afrodacus jarvisi ..	Not confirmed. (See p. 43).
Spondias cytherea Sonn. ..	Vi apple ..	*Strumeta tryoni* ..	
		Strumeta humeralis	Occasional specimens.
ANNONACEAE			
Annona reticulata L. ..	Bullock's-heart	*Strumeta tryoni* ..	
Annona squamosa L. ..	Custard apple ..	*Strumeta tryoni* ..	Not usually infested.
Cananga odorata (Lam.) Hook. f. & Thoms.	Ylang-ylang ..	*Strumeta endiandrae*	
		Strumeta kraussi ..	
Polyalthia nitidissima (Dun.) Benth.	Canary beech ..	*Strumeta tryoni* ..	
Rauwenhoffia leichhardtii (F. Muell.) Diels		*Strumeta halfordiae*..	Breeds in large numbers.
		Strumeta tryoni ..	Occasional specimens.
APOCYNACEAE			
Alyxia ruscifolia R. Br. ..	a Chain-fruit ..	*Strumeta tryoni* ..	Not usually infested.
Alyxia spicata R. Br. ..	a Chain-fruit ..	*Strumeta alyxiae* ..	
Carissa ovata R. Br. ..	Currant bush ..	*Strumeta tryoni* ..	Not confirmed. (See p. 66).
Ochrosia elliptica Labill. ..		*Strumeta tryoni* ..	
Thevetia peruviana (Pers.) Schum.	Yellow oleander	*Strumeta kraussi* ..	
BARRINGTONIACEAE			
Barringtonia calyptrata R. Br.	a Barringtonia..	*Strumeta barringtoniae*	
Planchonia careya (F. Muell.) R. Knuth	Cockatoo apple	*Afrodacus jarvisi* ..	Usually heavily infested.

Botanical Name.	Common Name.	Species Recorded.	Remarks.
CACTACEAE			
Opuntia ficus-indica Mill. . .	Indian fig . .	*Strumeta tryoni* . .	
CAPPARIDACEAE			
Capparis lucida (DC.) R. Br. ex Benth		*Diplodacus signatifer*	
		Strumeta tryoni . .	Not confirmed. (See p. 66).
		Strumeta humeralis	Not confirmed. (See p. 56).
		Strumeta musae . .	Doubtful record. (See p. 59).
Capparis mitchellii Lindl. . .	a Native pomegranate	*Strumeta tryoni* . .	Not confirmed. (See p. 66).
Capparis nobilis (Endl.) F. Muell. ex Benth.	a Native pomegranate	*Strumeta tryoni* . .	Not confirmed. (See p. 66).
CARICACEAE			
Carica papaya L.	Papaw	*Strumeta tryoni* . .	Ripe fruit stung.
		Austrodacus cucumis	Occasional host.
		Strumeta musae . .	Doubtful record. (See p. 59).
CELASTRACEAE			
Elaeodendron australe Vent.		*Strumeta tryoni* . .	
Siphonodon australe Benth.	Ivorywood . .	*Strumeta tryoni* . .	Not usually infested.
COMBRETACEAE			
Terminalia catappa L. . .	Tropical almond	*Strumeta tryoni* . .	
		Afrodacus jarvisi . .	
Terminalia melanocarpa F. Muell.		*Strumeta tryoni* . .	
		Strumeta humeralis . .	
Terminalia muelleri Benth.		*Strumeta tryoni* . .	
		Strumeta bilineata . .	Not confirmed. (See p. 49).
		Strumeta fuscatus . .	Not confirmed. (See p. 52).
CUCURBITACEAE			
Bryonopsis laciniosa (L.) Naud.	Native bryony . .	*Strumeta bryoniae* . .	Usually infested.
		Zeugodacus synnephes	Occasional specimens.
		Austrodacus cucumis	Chiefly North Queensland.
		Strumeta tryoni . .	Doubtful record. (See p. 69).
Cucumis melo L.	Rock melon . .	*Austrodacus cucumis*	
Cucumis sativus L. . .	Cucumber . .	*Austrodacus cucumis*	
Cucurbita pepo L.	Pumpkin . .	*Austrodacus cucumis*	
Cucurbita pepo L. var. *melo-pepo* Alef.	Squash . .	*Austrodacus cucumis*	
Cucurbita pepo L. var. *medullosa* Alef.	Marrow	*Austrodacus cucumis*	
Melothria cunninghamii (F. Muell.) Benth.	a Native cucurbit	*Strumeta bryoniae* . .	

Botanical Name.	Common Name.	Species Recorded.	Remarks.
Melothria maderaspatana (L.) Cogn.	a Native cucurbit	*Strumeta bryoniae* ..	
Momordica charantia L. ..	Chinese bitter cucumber	*Austrodacus cucumis*	
Sechium edule Sw.	Choko	*Austrodacus cucumis*	Oviposition in newly formed fruit only.
CUNONIACEAE			
Davidsonia pruriens F. Muell.	Davidsonian plum	*Strumeta tryoni* ..	Not confirmed. (See p. 66).
Schizomeria ovata D. Don ..	White birch ..	*Strumeta tryoni* ..	
Schizomeria whitei J. Mattf.	Northern white birch	*Strumeta kraussi* ..	
EBENACEAE			
Diospyros australis (R. Br.) F. M. Bail.		*Strumeta tryoni* ..	
Diospyros kaki L. f. ..	Persimmon ..	*Strumeta tryoni* ..	
		Afrodacus jarvisi ..	
EUPHORBIACEAE			
Glochidion ferdinandii Muell. Arg.		*Strumeta tryoni* ..	
		Strumeta fuscatus ..	
Glochidion harveyanum Domin		*Strumeta breviaculeus*	
		Austrodacus cucumis	Doubtful record. (See p. 46).
Hemicyclia australasica Muell. Arg.	Grey boxwood..	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
FLACOURTIACEAE			
Dovyalis caffra (Harv. & Sond.) Warb.	Kei apple ..	*Strumeta tryoni* ..	
Flacourtia jangomas (Lour.) Miq.		*Strumeta tryoni* ..	
GUTTIFERAE			
Calophyllum inophyllum L.	Calophyllum ..	*Asiadacus calophylli*	Usually infested.
Garcinia kajewskii C. T. White	a Native mangosteen	*Heterodaculus visendus*	
Garcinia tinctoria (DC.) W. F. Wight		*Paratridacus expandens*	
ICACINACEAE			
Gomphandra australiana F. Muell.		*Melanodacus niger* ..	
Irvingbaileya australis (C. T. White) Howard		*Strumeta kraussi* ..	
JUGLANDACEAE			
Juglans regia L.	Walnut ..	*Strumeta tryoni* ..	
LAURACEAE			
Beilschmiedia obtusifolia (F. Muell.) F. Muell.	Blush walnut ..	*Strumeta tryoni* ..	
		Strumeta endiandrae	

Botanical Name.	Common Name.	Species Recorded.	Remarks.
Cryptocarya erythroxylon Maid. & Betche	Southern maple	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta endiandrae	
Endiandra compressa C. T. White	Queensland greenheart	*Strumeta tryoni* ..	
		Strumeta humeralis	
		Strumeta kraussi ..	
Endiandra discolor Benth...	Rose walnut ..	*Strumeta endiandrae*	Usually infested.
		Strumeta tryoni ..	
		Strumeta kraussi ..	Occasional specimens.
Endiandra palmerstonii (F. M. Bail.) White & Francis	Queensland walnut	*Strumeta kraussi* ..	
Litsea leefeana (F. Muell.) Merr.	a Bollywood ..	*Afrodacus mesoniger*	
		Strumeta endiandrae	Doubtful record. (See p. 51).
Litsea reticulata (Meissn.) Benth.	a Bollywood ..	*Afrodacus mesoniger*	
Neolitsea involucrata (Lam.) Alston	Grey Bollywood	*Afrodacus mesoniger*	
Persea gratissima Gaertn. f.	Avocado ..	*Strumeta tryoni* ..	
LOGANIACEAE			
Fagraea cambageana Domin		*Strumeta fagraea* ..	Usually infested.
Fagraea muelleri Benth. ..		*Strumeta fagraea* ..	Usually infested.
Strychnos bancroftiana F. M. Bail.		*Strumeta recurrens* ..	Usually infested.
MELIACEAE			
Aglaia ferruginea White & Francis		*Neozeugodacus algaiae*	
Aglaia sapindina (F. Muell.) Harms		*Zeugodacus atrisetosus*	
		Neozeugodacus algaiae	
		Strumeta tryoni ..	
Owenia venosa F. Muell. ..	Crow's apple ..	*Strumeta tryoni* ..	Not usually infested.
MORACEAE			
Cudrania javanensis Trécul.	Indian cockspur	*Strumeta bancroftii* ..	Usually heavily infested.
		Strumeta tryoni ..	Occasional host.
Ficus carica L.	Fig	*Strumeta tryoni* ..	Overripe fruit stung.
		Strumeta melas ..	Occasional specimens.
Ficus glomerata Willd. ..	a Cluster fig ..	*Strumeta tryoni* ..	
		Strumeta halfordiae ..	
Ficus macrophylla Desf. ..	Moreton Bay fig	*Strumeta tryoni* ..	One record only.
Ficus watkinsiana F. M. Bail.	Green-leaved Moreton Bay fig	*Strumeta tryoni* ..	Doubtful record. (See p. 67).
Morus alba L.	White mulberry	*Strumeta tryoni* ..	
Morus nigra L.	Black mulberry	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis ..	Usually infested.

Botanical Name.	Common Name.	Species Recorded.	Remarks.
MUSACEAE			
Musa banksii F. Muell. ..	a Native banana	*Strumeta musae* ..	Usually heavily infested.
Musa nana Lour.	Dwarf banana..	*Strumeta musae* ..	In North Queensland only.
		Strumeta tryoni ..	Ripe fruit stung.
Musa paradisiaca L. var. *sapientum* (L.) Kuntze	Sweet plantain banana	*Strumeta musae* ..	In North Queensland only.
MYRTACEAE			
Acmena macrocarpa C. T. White		*Strumeta kraussi* ..	
Eugenia australis Wendl. ex Link	Creek lilly pilly	*Strumeta tryoni* ..	
		Strumeta kraussi ..	
Eugenia cormiflora F. Muell.		*Strumeta kraussi* ..	
		Strumeta tryoni ..	
		Afrodacus jarvisi ..	
Eugenia corynantha F. Muell.	Sour cherry ..	*Strumeta halfordiae*..	
		Strumeta tryoni ..	
Eugenia jambos L.		*Strumeta tryoni* ..	
Eugenia luehmannii F. Muell.	Small-leaved water gum	*Strumeta kraussi* ..	
Eugenia smithii Poir. ..	Lilly pilly ..	*Strumeta tryoni* ..	
Eugenia suborbicularis Benth.		*Strumeta tryoni* ..	
		Strumeta kraussi ..	
		Afrodacus jarvisi ..	
Eugenia tierneyana F. Muell.		*Strumeta kraussi* ..	
Eugenia uniflora L. ..	Brazilian cherry	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis..	Occasional specimens.
		Strumeta halfordiae..	Occasional specimens.
Feijoa sellowiana Berg ..	Feijoa	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis..	Occasional specimens.
		Strumeta halfordiae..	Occasional specimens.
Psidium cattleianum Sabine	Cherry guava ..	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis..	Occasional specimens.
Psidium guajava L. ..	Guava	*Strumeta tryoni* ..	Usually heavily infested.
		Strumeta humeralis..	Usually infested.
		Afrodacus jarvisi ..	Particularly in North Queensland.
		Strumeta melas ..	Occasional specimens.
		Strumeta kraussi ..	
		Strumeta breviaculeus	Not confirmed. (See p. 49).
Rhodamnia sessiliflora Benth.		*Strumeta tryoni* ..	
Rhodomyrtus macrocarpa Benth.	Finger cherry ..	*Strumeta kraussi* ..	
Syzygium branderhorstii Lauterb.		*Strumeta kraussi* ..	

Botanical Name.	Common Name.	Species Recorded.	Remarks.
OLEACEAE			
Notelaea longifolia Vent. ..		*Strumeta tryoni* ..	
Olea europaea L.	Olive	*Strumeta tryoni* ..	
Olea paniculata R. Br. ..	Native olive ..	*Melanodacus niger* ..	
ORCHIDACEAE			
Bulbophyllum baileyi F. Muell.		*Afrodacus jarvisi* ..	Males to flowers only. (See p. 44).
OXALIDACEAE			
Averrhoa carambola L. ..	Carambola or five corner	*Strumeta tryoni* ..	
PALMAE			
Phoenix dactylifera L. ..	Date palm ..	*Strumeta tryoni* ..	
PASSIFLORACEAE			
Passiflora alba Link & Otto	White passion fruit	*Strumeta tryoni* ..	Occasional host.
		Strumeta humeralis ..	Occasional host.
		Strumeta melas ..	Occasional host.
Passiflora aurantia Forst. ..		*Strumeta tryoni* ..	
Passiflora edulis Sims ..	Passion fruit ..	*Strumeta tryoni* ..	Larvae rarely develop.
Passiflora foetida L. ..	Stinking passion vine	*Strumeta bryoniae* ..	
Passiflora ligularis Juss. ..	Rock passion fruit	*Afrodacus jarvisi* ..	Males to flowers only. (See p. 44).
Passiflora quadrangularis L.	Granadilla ..	*Strumeta tryoni* ..	
Passiflora suberosa L. ..	Small-flowered passion vine	*Strumeta bryoniae* ..	
		Strumeta humeralis ..	
PUNICACEAE			
Punica granatum L. ..	Pomegranate ..	*Strumeta tryoni* ..	Split fruit stung.
		Afrodacus jarvisi ..	Occasional host.
RHAMNACEAE			
Dallachya vitiensis (Seem.) F. Muell.		*Strumeta tryoni* ..	
Zizyphus mauritiana Lam.	Chinee apple ..	*Strumeta tryoni* ..	
ROSACEAE			
Cydonia oblonga Mill. ..	Quince	*Strumeta tryoni* ..	
		Afrodacus jarvisi ..	One record only.
Eriobotrya japonica (Thunb.) Lindl.	Loquat ..	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis ..	Occasional specimens.
		Strumeta halfordiae ..	Occasional specimens.
		Strumeta melas ..	Occasional specimens.
Malus sylvestris Mill. ..	Apple	*Strumeta tryoni* ..	
		Strumeta melas ..	
		Strumeta humeralis ..	
		Afrodacus jarvisi ..	Stung in cage tests only.

Botanical Name.	Common Name.	Species Recorded.	Remarks.
Prunus armeniaca L. ..	Apricot ..	*Strumeta tryoni* ..	Usually infested.
		Strumeta humeralis ..	Occasional specimen.
		Strumeta bilineata ..	One record.
Prunus avium L.	Cherry	*Strumeta tryoni* ..	
Prunus domestica L. ..	Plum	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta melas ..	Very occasional specimens.
Prunus persica (L.) Batsch	Peach	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Afrodacus jarvisi ..	
		Strumeta melas ..	Very occasional specimens.
Prunus persica (L.) Batsch var. *nectarina* (Ait.) Maxim.	Nectarine ..	*Strumeta tryoni* ..	
Pyrus communis L. ..	Pear	*Strumeta tryoni* ..	
		Strumeta humeralis ..	Occasional specimens.
		Afrodacus jarvisi ..	Occasional specimens.
		Strumeta melas ..	Occasional specimens.
Rubus fruticosus L. ..	Blackberry ..	*Strumeta tryoni* ..	
RUBIACEAE			
Coffea arabica L.	Coffee	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
Nauclea orientalis L. ..	Leichhardt tree	*Strumeta pallidus* ..	Usually infested.
		Strumeta tryoni ..	
RUTACEAE			
Acronychia acidula F. Muell.	Scrub lemon ..	*Strumeta kraussi* ..	
Acronychia laevis Forst. ..		*Strumeta halfordiae* ..	
		Strumeta tryoni ..	Doubtful record. (See p. 69).
Aegle marmelos Correa ..	Bael fruit ..	*Strumeta tryoni* ..	
Citrus grandis Osbeck ..	Pomelo ..	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
Citrus limon Burm. f. ..	Lemon	*Strumeta tryoni* ..	Ripe fruit stung. (See p. 64.)
		Strumeta humeralis ..	
Citrus medica L.	Citron	*Strumeta tryoni* ..	Not usually infested.
Citrus paradisi Macf. ..	Grapefruit ..	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta halfordiae ..	Coastal regions.
		Strumeta melas ..	Occasional specimens.
Citrus reticulata Blanco ..	Mandarin ..	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta halfordiae ..	Coastal region.
Citrus sinensis Osbeck ..	Orange ..	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta halfordiae ..	Coastal regions.
		Callantra aequalis ..	Reported by Froggatt. (See p. 46).

Botanical Name.	Common Name.	Species Recorded.	Remarks.
Clausena brevistyla Oliv. . .		*Strumeta humeralis* . .	
Eremocitrus glauca (Lindl.) Swingle	Lime bush . .	*Strumeta tryoni* . .	
Fortunella japonica (Thunb.) Swingle	Kumquat . .	*Strumeta tryoni* . .	
		Strumeta humeralis . .	
		Strumeta halfordiae . .	Coastal areas.
		Strumeta melas . .	Occasional specimens.
		Strumeta mutabilis . .	One record.
Halfordia kendack (Montr.) Guillaum.	Saffron heart . .	*Strumeta halfordiae* . .	
SAPINDACEAE			
Arytera sp.		*Strumeta kraussi* . .	
Atalaya hemiglauca (F. Muell.) F. Muell. ex Benth.	Whitewood . .	*Strumeta tryoni* . .	Doubtful record. (See p. 69).
Castanospora alphandii (F. Muell.) F. Muell.		*Strumeta kraussi* . .	
		Strumeta tryoni . .	
Ganophyllum falcatum Bl. . .		*Strumeta tryoni* . .	
		Strumeta humeralis . .	
SAPOTACEAE			
Amorphospermum antilogum F. Muell.	Brown pearwood	*Strumeta tryoni* . .	
Mimusops elengi L. . .		*Strumeta tryoni* . .	
Niemeyera chartacea (F. M. Bail.) C. T. White		*Strumeta tryoni* . .	
		Strumeta humeralis . .	
		Strumeta halfordiae . .	
Planchonella australis (R. Br.) Pierre	Black apple . .	*Strumeta halfordiae* . .	
		Strumeta tryoni . .	
		Strumeta bilineata . .	
Planchonella obovata (R. Br.) H. J. Lam		*Strumeta fuscatus* . .	
		Strumeta bilineata . .	
		Strumeta humeralis . .	
Planchonella pohlmaniana (F. Muell.) Pierre ex Dubard	Yellow boxwood	*Strumeta bilineata* . .	
		Strumeta tryoni . .	
Planchonella sp.		*Strumeta pulcher* . .	One record only.
SMILACACEAE			
Rhipogonum papuanum C. T. White		*Strumeta tryoni* . .	Not confirmed. (See p. 68).
		Strumeta cacuminata	Doubtful record. (See p. 51).
SOLANACEAE			
Cyphomandra betacea Sendt.	Tree tomato . .	*Strumeta humeralis* . .	
Lycopersicon esculentum Mill.	Tomato . .	*Strumeta tryoni* . .	
		Strumeta humeralis . .	
		Austrodacus cucumis	Particularly in North Queensland.
		Strumeta cacuminata	One record only.

Botanical Name.	Common Name.	Species Recorded.	Remarks.
Physalis peruviana L. ..	Cape gooseberry	*Strumeta tryoni* ..	
Solanum auriculatum Ait...	Wild tobacco ..	*Strumeta cacuminata*	Usually infested.
		Strumeta tryoni ..	Occasional host.
Solanum laciniatum Ait. ..	Kangaroo apple	*Strumeta tryoni* ..	Occasional host.
		Strumeta humeralis ..	Occasional host.
Solanum seaforthianum Andr.	Brazilian nightshade	*Strumeta tryoni* ..	
		Strumeta humeralis ..	
		Strumeta cacuminata	Not confirmed. (See p. 51).
Solanum verbascifolium L...	Wild tobacco ..	*Strumeta cacuminata*	Always heavily infested.
SYMPLOCACEAE			
Symplocos thwaitesii F. Muell.		*Melanodacus niger* ..	
THYMELAEACEAE			
Phaleria clerodendron (F. Muell.) F. Muell. ex Benth.		*Strumeta kraussi* ..	
VITACEAE			
Cissus antarctica Vent. ..		*Strumeta tryoni* ..	Not confirmed. (See p. 69).
Vitis labruscana L. H. Bail.	Isabella grape ..	*Strumeta tryoni* ..	In certain years.
Vitis vinifera L.	Grape	*Strumeta tryoni* ..	In certain years.

Fig. 5.
Calophyllum inophyllum L., The Host of *Asiadacus calophylli* Perk. & May.
Cardwell, North Queensland.

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