

THE FRUIT FLIES OF CRETE (DIPTERA: TEPHRITIDAE)

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ABSTRACT

Forty-seven species of Tephritidae, 36 of which have been reared from hosts, are recorded from Crete, most of them for the first time. A list of 47 host plants is given.

*KEY WORDS:* Tephritidae, host plants, Crete.

INTRODUCTION

The tephritid fauna of Crete (Greece) was never studied systematically. The only species described from Crete are *Katonaia* (= *Siticola*) *hemileopsis* (Hering, 1947), *Urophora neuenschwanderi* and *Terellia sabroskyi* (Freidberg, 1982) which are endemic, and *Myopites apicatus* (Freidberg, 1979), which is known also from Italy and Israel. Moreover, the tephritid fauna of the whole state of Greece is rather poorly known, and the available information about it is scattered in several publications (e.g. Hendel, 1927; Dirlbek and Dirlbek, 1966, 1972). Dirlbek and Dirlbek (1972) listed 28 species from Greece, and the following number of species from other Balkan countries: Albania: 46, Yugoslavia: 74, and Bulgaria: 80. Thus, the Cretan fauna, with 47 species known to-date, compares well with the size of the faunae of neighbouring countries.

From the zoogeographical point of view the Cretan fauna is strictly Palaearctic and distinctly Mediterranean. This is especially reflected in the relative richness of species of *Tephritis* (10), *Urophora* (5), *Myopites* (4) and *Terelliinae* (10). *Euaresta bullans* (Wiedemann), originating in Central or South America, is a recent introduction. Another recent introduction into Crete, that of *Rhagoletis cerasi* (Linnaeus), established a new southern border for this otherwise more northern species. Because of this strict zoogeographical affinity we have not given the general distribution of the species in the following list. Distributions, additional host plants and keys to most of the Cretan Tephritidae can be found in Hendel (1927).

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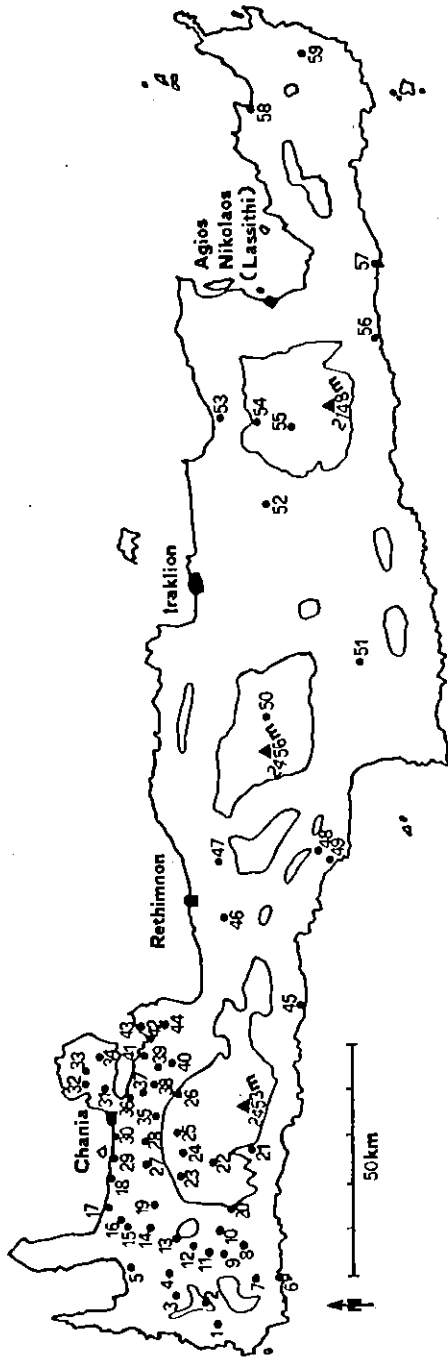


Fig. 1. Sampling localities of fruit flies in Crete, as mentioned in the text, from 1975 to 1981. Contour = 800 m isohypse.

Aerions - 2, Afganiki - 48, Aghi Apostoli - 30, Agia - 27, Agia Marina - 29, Agios Antonios - 15, Almyrida - 42, Amygdalokephali - 1, Cavalochori - 44, Chorafakia - 32, Deres - 19, Drapanias - 5, Floria - 11, Francokastello - 45, Gonia - 46, Ideon Antron - 50, Ierapetra - 57, Ilias - 33, Kakopetros - 13, Kalyves - 41, Kampi - 26, Kandalanos - 9, Kato Moulia - 51, Kera - 54, Korakies - 31, Lakki - 24, Loulos - 35, Malaxa - 38, Malia - 53, Megala Chorafia - 39, Messavlia - 12, Moni Preveli - 49, Mothiana - 16, Nea Myrtos - 56, Omalos - 22, Orthoumi - 23, Palochora - 6, Pazinos - 34, Plaka - 43, Platanias - 18, Prasses - 47, Psychro - 55, Samaria - 21, Sambas - 52, Sfinari - 20, Sirikari - 3, Sitia - 58, Sfaki - 10, Souda - 36, Stylos - 40, Tavronitis - 17, Temenia - 8, Therisso - 25, Topolia - 4, Tsikalaria - 37, Vari-petros - 28, Vliethias - 7, Voukolies - 14, Zakros - 59.

## MATERIALS AND METHODS

This study is based on about 2000 preserved specimens, most of which were collected by the senior author in the western part of Crete (Chania District; Fig. 1). Fewer collections were made in the districts of Rethimnon, Iraklion, and Lassithi; in the text they are indicated in parenthesis following the name of the locality.

Tephritids were searched for at all altitudes from sea level up to over 2400 m in the Psiloritis mountains in the Iraklion district and the massif of the White Mountains in the Chania district. However, probably because of the scarcity of the vegetation at higher altitudes, flies were extremely rare above 1200 m. Special attention was given to the flora of the steep walls of gorges, a plant association which is extremely rich in endemic species (Horvat *et al.*, 1975). Moreover, in summer, numerous fruit flies were swept from non-host trees in the mountains where they probably searched shelter from the heat.

Throughout the year, sweep-net samples were taken at least once per week, and flower heads, leaves with mines, and stem galls were collected. This plant material was stored in paper bags at room temperature. A total of 814 samples was taken, out of which 234 yielded tephritids. Except where otherwise noted the plants belonged to the family Compositae; they were identified by B. Senn (of Bern University) by means of the *Flora Europaea* (Tutin *et al.*, 1972). The emerging flies were collected alive in a vial which was fixed to the opening of each bag, or retrieved dead from the bag at the end of the emergence period. In addition, numerous olive and cherry samples were taken at regular intervals; they were listed in the articles cited for the olive (*Dacus oleae*) and cherry (*Rhagoletis cerasi*) flies. Various tephritid species were also recovered from protein baited McPhail traps and sticky yellow traps which were used for monitoring olive and cherry flies. In addition to the senior author's collection, flies were collected by the junior author, by F. Bigler (Reckenholz, Switzerland), R. Danielsson (Lund, Denmark), and S. Michelakis (Chania, Greece). In the text, their material is cited by their initials. Unless otherwise stated, the dates given are collection dates. Most emergences occurred within a few weeks after collection and are not indicated specifically. The systematic arrangement follows closely that of Hendei (1927). Most of the specimens are deposited in the P. Neuenschwander collection and in the entomological collection of Tel Aviv University. Other specimens were returned to the collectors mentioned above.

### THE CRETAN TEPHRITIDAE

#### *Dacus oleae* (Gmelin)

Adults were caught abundantly all year round, and reared from wild and cultivated olives, from sea level to the upper limit of olive trees at about 800 m altitude. The ecology of this monophagous and polyvoltine species, which is the most important local pest insect, was intensively investigated (Michelakis, 1980; Bigler, 1980; Neuenschwander *et al.*, 1983b). Because of their widespread but undirected dispersal, adults were also caught on many other tree species (Michelakis & Neuenschwander, 1981).

### *Urophora affinis* (Frauenfeld)

Reared and swept from *Centaurea spinosa* on the sandy beach at Platania (24.VII.81, 11.VIII.81). Emergence occurred in Spring 1982. The same species was swept from neighbouring *Otanthus maritimus* on 15.VI.80, and in the mountains at Aerinos on 18.VI.80. For biological control of two knapweeds, this species has recently been successfully introduced into Canada (Harris, 1980).

### *Urophora macrura* (Loew)

A few specimens were swept from low vegetation on stony ground on four occasions: Pazinos, 29.IV.79; Korakies, 20.V.79, both on the Akrotiri Peninsula, and Loulos, 18.V.80 and near Therisso at 850 m on 1.VI.80 in the mountains.

### *Urophora neuenschwanderi* Freidberg

A recently described species (Freidberg, 1982), which was reared from flower head galls on *Ptilostemon gnaphaloides*. The species, which is endemic to Crete, was recorded from Aerinos, Therisso and Orthouni (Chania), Prasses and Gonia (Rethimnon). Additional records are: Kakopetros (9.VII.81, coll. A.F.; 16.VIII.81), Therisso (14.VIII.81), and Kera (Lassithi) (8.XI.81). In Therisso it was also reared from a new host plant, *Stachelina arborea* (8.VII.81). Generally, a few specimens emerged in the same year, but most adults appeared only in May-July of the following year.

### *Urophora stylata* (Fabricius)

Commonly reared from *Galactites tomentosa*, *Carduus pycnocephalus*, *Cirsium creticum*, *Centaurea calcitrapa* up to about 600 m altitude, between late June and late August. One male was swept from *Dittrichia viscosa* on 12.IX.79 at Almyrida.

### *Urophora* sp. cf. *jaceana* (Hering)

Often reared from *Centaurea solstitialis* from Omalos in July, where it was swept also from other thistles. Also swept from *Chrysanthemum* sp. in the mountains at Loulos (18.V.80) and Kampi (26.V.80). Last emergence was observed at the end of September.

These specimens belong to a species complex that contains *U. jaceana* (Hering), *U. jaculata* (Rondani), *U. sirunaseva* (Hering) and probably others. Using Steyskal's (1979) key one may reach *U. jaceana*, but as this complex is in need of revision (Steyskal, 1979), we refrain from naming our specimens at this time.

### *Myopites apicatus* Freidberg

A few specimens of this recently described species (Freidberg, 1979) were reared from flower head galls on *Pulicaria dysenterica* from the lowlands, near water (Agia, 5.VII.78; Almyrida, 5.VII.81; Tavronitis, 11.VII.81, coll. A.F.; Drapanias, 5.X.79). Adults emerged in the same month from galls collected on 5.VII.78; galls collected on 5.X.79 yielded adults during March of the following year.

### *Myopites lelae*? Dirlbek

Adults emerged on 2.V.80 from flower head galls on *Inula crithmoides* collected on 9.XII.79 along a rocky sea coast at Plaka. This was the only site in Crete where *I. crithmoides* was found. One female was swept from *Pulicaria odora* on 23.V.80 near Therisso.

The specimens fit rather closely to the original description and figure of *lelae* (Diribek, 1974) which were based on a single female from Southern France. However, the ov scape is about equal in length to the preabdomen, not longer, and the distal tarsomeres are distinctly darker than the basal ones, not concolourously pale. A safe determination of the specimens should await a revision of this genus.

#### *Myopites stylatus* (Fabricius)

Commonly swept and reared from the flower head galls of *Dittrichia viscosa* from sea level up to about 700 m. The life-cycle, based on 26 samples of 100-200 galls each, from Megala Chorafia, is as follows: While flowering starts at the end of August, the first galls appear only at mid-October; the last galls on the dry plants are found in mid-May. Emergence of adults is from March to December of the second year. This species is an alternate host for the olive fly parasitoid *Eupelmus urozonus* Dalman (Silvestri and Martelli, 1909). In Crete, it was the only important alternate host of this parasitoid (Neuenschwander *et al.*, 1983a).

#### *Myopites zernyi* Hering

Commonly reared and swept from *Pulicaria odora* and *P. dysenterica* from sea level up to about 600 m, from end of May to mid-August. Also swept from *Dittrichia viscosa* (Almyrida, 31.VIII.80). Emergence from the galls started in July, continued up to December, and reached a second peak in March-April of the following year. Until now this species has only been known from Yugoslavia (Hering, 1939).

#### *Ceratitis capitata* (Wiedemann)

Reared from grapefruit, oranges, mandarins, and pears, but despite extensive search in the wild vegetation, never from figs. Adults were caught from the former trees all year round, but also swept from olive trees, or, at lower elevations, caught in McPhail traps and on sticky yellow traps used for monitoring *D. oleae*. This species is an important pest insect in most citrus growing areas in the world (Kranz *et al.*, 1978). It has recently been introduced into, and again eradicated from, California (Hagen *et al.*, 1981). It is claimed to be suppressed in Crete by the frequent bait sprays applied against *D. oleae* (S. Michelakis, personal communication).

#### *Rhagoletis cerasi* (Linnaeus)

This univoltine species commonly infests cherries in several valleys in the mountains of the Chania district (Orthouni, Deres, Kandanos). As a recently introduced pest insect it was still absent in 1981 from the main Cretan cherry growing areas in the Rethimnon and Iraklion districts. Its exact distribution, spread, and presumed means of introduction, as well as some details concerning its ecology in Crete are presented by Neuenschwander *et al.* (1983c). The natural distribution of this species which occurs in two morphologically indistinguishable but sexually partly incompatible races ranges from central and southern Europe to Turkey and Iran (Boller *et al.*, 1976).

#### *Euleia heraclei* (Linnaeus)

In April, the dark form of this leaf-mining species was swept from one of its host plants, *Smyrnium perfoliatum* (Umbelliferae) (Temenia, 29.IV.80), and caught in McPhail traps on olive trees at Megala Chorafia (13.IV.78, coll. F.B.), as well as on

sticky yellow traps on cherry trees in numerous mountain localities in all parts of Crete, which were monitored for *R. cerasi*. In the same areas, the light form was swept or trapped mostly from olive and cherry trees from end of May to early July.

#### *Aciura coryli* (Rossi)

A few specimens were reared from *Phlomis fruticosa* (Megala Chorafia, 17.IV.76; 28.IV.76), *Stachys cretica* (Megala Chorafia, 7.VI.78), *Ballota pseudodictamnus* (Tsikalara, 21.VI.78), and *Sideritis syriaca* (near Omalos, at 1400 m altitude, 5.VII.78) (all Labiatae), and also swept from *Cupressus sempervirens* (Cupressaceae) (Omalos, 16.VIII.79).

#### *Katonaia hemileopsis* (Hering)

Commonly reared and swept from the south Aegean endemit, *Ballota pseudodictamnus* (Labiatae), from sea level to about 800 m, from early March to mid-July. This species was described and hitherto known from a single female collected at Sitia, Crete (Hering, 1947). It differs from the two other congeners (*K. arushae* Munro from East Africa and *K. aida* Hering from Israel and Egypt) by the more extensive dark area of the wing pattern, which often reaches the posterior margin immediately proximal to end of vein CuA<sub>1</sub>, and extends along this edge half way from end of vein M to end of vein CuA<sub>1</sub>. The femora, especially the fore and hind pairs, are blackened basally, sometimes up to about the middle. The male is similar to the female in all specific characters.

#### *Spathulina sicula* Rondani (= *S. tristis*)

Commonly reared from stem galls on *Phagnalon rupestre* in February and March, but specimens were also swept from this plant on 25.IV.79 at Amygdalokephali, and on 17.V.79 at Ideon Antron (Rethimnon) at over 1000 m altitude. A single female was reared on 23.V.78 from *Helichrysum stoechas* collected at Afganiki (Rethimnon). No stem galls were found, and this record therefore remains doubtful.

#### *Chaetorellia* sp.

Reared from *Centaurea solstitialis* from Vlithias (9.VI.78), and swept at Kandanos (9.VII.81, coll. A.F.). A revision of *Chaetorellia* is badly needed. The specimens on hand have 10 shining black, round spots on the notum similar to *C. carthami* Stackelberg, to which they seem to be related. Zwölfer (1972) conducted a detailed study of *Chaetorellia* populations reared from *C. solstitialis* in southern Italy and compared them with *C. carthami* reared from *Carthamus tinctorius*. He concluded that the South-Italian population is either a subspecies of *C. carthami* or a semispecies belonging to the *C. carthami* group. The Cretan specimens are similar to those from southern Italy, and the same conclusion probably applies to them. This pest insect on saffowers has recently been studied in Iraq (Al-Ali *et al.*, 1978/79).

#### *Chaetostomella onotrophes* (Loew)

Commonly reared from *Carduus pycnocephalus*, *Centaurea solstitialis*, *Galactites tomentosa*, *Lamyropsis cynaroides*, *Notobasis syriaca*, *Onopordum bracteatum*, *Picnomon acarna*, *Ptilostemon gnaphaloides*, at practically all collection sites up to the Kallergi hut at 1700 m altitude near Omalos, from late April to mid-September. Old

*P. acarna* flower heads from the previous year, collected at Malaxa on 2.IV.76, yielded flies on 20.IV.76, indicating that winter can be passed in an immature stage.

#### *Terellia fuscicornis* (Loew)

Rather commonly reared from *Cynara scolymus*, and once swept from *C. cardunculus* (?), up to about 300 m altitude, from end of May to end of August. In February-March two males emerged from artichokes which had been collected on 12.XII.75 at Sambas (Iraklion), indicating that overwintering occurs, at least partly, in the pupal stage. This species was investigated in more detail in southern continental Greece, where it causes commercial damage on artichokes (Stavraki & Stavrakis, 1968) and in Italy (Martelli, 1952).

#### *Terellia sabroskyi* Freidberg

This newly discovered species was found at almost all sites where its host plant, *Ptilostemon gnaphaloides*, could be collected: In addition to the localities listed in the original description (Freidberg, 1982) the fly was reared from its host plant from the Samaria gorge (10.VII.81), Kakopetros (9.VII.81, coll. A.F.; 16.VIII.81), and Moni Preveli (Rethimnon) (14.IX.81). Flower heads containing larvae were collected from late May onward. Emergence occurs up to August of the same year, but most individuals pass the winter as fully grown larvae and emerge from mid-May to mid-July of the following year.

#### *Terellia serratulae* (Linnaeus)

Commonly reared from *Galactites tomentosa*, *Lamyropsis cynaroides*, *Carduus pycnocephalus*, and swept also from other thistles, between end of April and end of August, in most sampling localities at all altitudes up to 1200 m.

#### *Terellia virens* (Loew)

Reared from *Centaurea argentea*, an endemite of Crete and Kithira, from Topolia (18.VI.80) and Therisso (13.VI.80), and abundantly swept from *Centaurea solstitialis* from Omalos (29.VII.80).

#### *Orellia colon* (Meigen)

Commonly reared from *Carthamus boissieri*, *C. lanatus*, *Carlina corymbosa* and *Galactites tomentosa* from mid-May to late August (swept until mid-September), from most sampling localities from sea level up to about 500 m altitude.

#### *Orellia falcata* (Scopoli)

Reared from *Tragopogon longirostris*. The larvae live singly in the basal part of the stem. Rearing was successful only when the larvae were kept under cold and humid conditions, simulating winter (Ilias Akrotiri, 17.V.80, and Francokastello, 28.V.80).

#### *Orellia lappae* (Cederhjelms)

Commonly reared and swept from *Onopordum bracteatum* from the sea coast to about 1200 m, between end of May and mid-August. Most adults emerged within a few weeks but flower heads collected on 24.V.78 at Nea Myrtos (Lassithi) yielded flies only on 23.IX.78.

*Orellia steropea* (Rondani)

Reared from flower heads of *Atractylis gummifera* from Agios Antonios (1.VIII.75), Mothiana (2.VIII.81), Messavlia (7.IX.77), and Varipetros (5.IX.80). Flies collected on 1.VIII.75 emerged on 4.IX.75, those collected on 5.IX.80 emerged on 15.VII.81. This species was known until now from Italy only (Rondani, 1870).

*Paroxyna elongatula* (Loew)

Three specimens were swept from *Dittrichia viscosa* and *Calendula arvensis* around Chania (Souda, 14.IX.77; Chorafakia, 2.XII.79; 7.XII.79).

*Paroxyna tessellata* (Loew)

Frequently swept from *Pallenis spinosa*, *Chrysanthemum* sp., and *Calendula arvensis*, from March to June, and from *Bellis* sp. in December (Chorafakia 2.XII.79). Also caught on sticky yellow traps in autumn (Paleochora, 4.X.77) and during winter (Paleochora, 11.I.78).

*Actinoptera mamulae* (Frauenfeld)

Commonly reared or swept from *Helichrysum stoechas*, from numerous localities from the beach up to 1000 m altitude, between early March and mid-August.

*Sphenella marginata* (Fallén)

Single specimens were swept from *Chrysanthemum* sp. (Chorafakia, 4.III.79; 21.IV.79; Paleochora, 9.IV.80), *Achillea cretica* (Kalyves, 10.V.80), *Carthamus lanatus* (Moni Preveli [Rethimnon], 12.VI.79), or *Calendula arvensis* (Chorafakia, 2.XII.79), and also near Malia (Iraklion) (19.V.79, coll. R.D.). One specimen was reared from the south Aegean endemite, *Senecio gnaphalodes*, from Zakros (Lassithi) (30.VIII.81).

*Ensina sonchi* (Linnaeus)

Five specimens were swept mostly from *Reichardia picroides* in summer (Platanias, 12.VIII.81; Floria, 16.VIII.81; Souda, 31.VIII.79; and also Paleochora, 9.VII.81; Tavronitis, 11.VII.81, both by A.F.).

*Euaresta bullans* (Wiedemann)

Despite extensive search, this introduced species was found only in one locality and one year. It was reared from the hooked burs of, and swept from, *Xanthium spinosum*, a species of South American origin, at Souda on 5.VII and 28.VII.80.

*Tephritis formosa* (Loew)

In the lowlands swept from low plants or olive trees from end of March to May; in the mountains up to 1000 m from *Quercus ilex* (Fagaceae) and *Cupressus sempervirens*, between June and end of August.

*Tephritis matricariae* (Loew)

Reared from *Crepis foetida* (?) (Agia Marina, on the sandy beach, 25.VI.78; 15.VI.80) and from *Hypochoeris cretensis* (Kato Moulia [Iraklion], 23.V.78; Kandanos, 6.VII.78). Commonly swept from low vegetation from early April onward. During summer up to mid-September swept in the mountains from *Cupressus sempervirens*, *Quercus ilex*, and *Erica arborea* (Ericaceae).



*Tephritis nigricauda* (Loew)

Single specimens swept from low vegetation, from many localities in the Chania district from sea level up to 850 m, from mid-April to early June.

*Tephritis poecilura* (Loew)

One male was caught on 27.IV.80 at Agia Marina, and one pair was swept from *Cupressus sempervirens* at Omalos on 16.VIII.79.

*Tephritis postica* (Loew)

Rather commonly swept (in small numbers) or reared from *Onopordum bracteatum*, from sea level up to Omalos at 1200 m, from early April to mid-August.

The Cretan specimens were compared with the type specimens of *postica* Loew (from Central Europe) and of the closely related *posis* Hering (from Spain). They have a relatively short oviscape, as in *postica*, but other characteristics, such as colouration, as in *posis*. Similar kinds of intergradations occur in other East-Mediterranean populations, indicating the presence of a complex of species, or a single variable species. We, therefore, decided to use the oldest name available for this group.

*Tephritis praecox* (Loew)

Commonly swept from *Calendula arvensis* from end of January in the lowlands to end of April in the mountains (Sirikari, 30.IV.80). One pair was caught on 2.XII.79 at Chorafakia.

*Tephritis separata* Rondani

A few specimens were caught on three occasions: Amygdalokephali, 25.IV.79; Therisso, 1.VI.80; Paleochora, 9.VII.81 (coll. A.F.).

*Tephritis simplex* (Loew)

A few specimens were swept from low vegetation in spring, but more flies were caught on olive trees (the earliest on 7.II.78 at Stylos, coll. F.B.) or from *Cupressus sempervirens* at Omalos in August.

One female with a wing pattern similar to *T. simplex*, but with the base of the abdomen yellow, was swept from a cherry tree at Psychro (Lassithi) on 24.VI.80. This specimen may actually represent another, undescribed species.

*Tephritis stictica* (Loew)

Commonly swept and reared from *Otanthus maritimus* on sandy beaches, from early May to mid-August. This species has been investigated in detail in Italy (Rivosecchi, 1957).

*Tephritis vespertina* (Loew)

Reared once from *Picris echioides* from Floria (23.VI.78). Single specimens were swept between end of April and mid-September from localities in the mountains (Therisso, area of Kandanos, area of Sfinari, Omalos) from *Centaurea calcitrapa*, but also from *Erica arborea* and *Cupressus sempervirens*. In the same region, this species was recovered from sticky yellow traps, including one male from Paleochora on 2.VIII.77.

### *Trupanea amoena* (Frauenfeld)

Single specimens were swept from *Chrysanthemum* sp. from several localities in the Chania district up to about 800 m altitude, between April and June or August and September.

### *Trupanea stellata* (Fuessly)

A few specimens reared from *Chamomilla recutita* (Chania, 16.V.75; 29.V.78), *Anthemis* sp. (Cavalochori, 24.IV.79), and *Helichrysum stoechas* (Chorafakia, 21.IV.79). This species is also commonly swept, mainly from *Chrysanthemum* sp., up to about 1000 m altitude, from February to early June. One male was swept from *Quercus coccifera* on 4.IX.75 at Malaxa, and a pair from *Dittrichia viscosa* on 6.X.81 at Aghi Apostoli (Chania).

### *Acanthiophilus helianthi* (Rossi)

Commonly reared from *Centaurea calcitrapa*, *C. solstitialis*, *Scolymus hispanicus*, *Carthamus boissieri*, *C. lanatus*, *Notobasis syriaca*, *Galactites tomentosa*, *Carduncellus caeruleus*, — at practically all sampling sites, between end of March and mid-September. In the Old World this species is a serious pest of safflower. It has recently been investigated in detail in Iraq (Al-Ali, *et al.*, 1977).

### *Capitites ramulosa* (Loew) (= *Acanthiophilus ramulosus*)

Single specimens were reared or swept from *Phagnalon rupestre* from mid-March to early May (Voukolies, 14.III.79; Paleochoira, 9.IV.80; Moni Preveli [Rethimnon], 19.IV.79; Agia Marina, 5.V.80), or swept from *Cupressus sempervirens* and *Quercus ilex* in the mountains in summer (Lakki, 6.VI.79; Omalos, 16.VIII.79). One pair was caught on sticky yellow traps on 11.I.78 in Paleochoira.

### *Tephritomyia lauta* (Loew)

Commonly reared and swept from *Echinops sphaerocephalus* from end of May in Ierapetra (Lassithi) on the south coast to end of July in the mountains at Omalos. One pair was swept from *Chrysanthemum* at Sfaki, on 29.IV.80, long before *Echinops* was flowering. The Chania district is the westernmost record of this species in the Northern Mediterranean.

## A LIST OF CRETAN TEPHRITID HOST PLANTS

This list contains all plants from which tephritids have been reared, and those from which tephritids were collected. It is arranged alphabetically by families, genera and species. For each proven host the reared flies are listed together with the actual or suspected infested part. In the latter case, a question mark is added. The following abbreviations are used: FH — Flower Head; FHG — Flower Head Gall; FL — Flower; FR — Fruit; LE — Leaf; SG — Stem Gall; ST — Stem.

### *Compositae*

*Achillea cretica* L.

*Anthemis* sp.

*Arctostaphylos gummifera* L.

*Trupanea stellata* (Fuessly) (FH)

*Orellia steropea* (Rondani) (FH)

- Bellis* sp.  
*Calendula arvensis* L.  
*Carduncellus caeruleus* (L.) C. Presl  
*Carduus pycnocephalus* L.
- Carlina corymbosa* L.  
*Carthamus boissieri* Holácsy
- Carthamus lanatus* L.
- Centaurea argentea* L.  
*Centaurea calcitrapa* L.
- Centaurea solstitialis* L.
- Centaurea spinosa* L.  
*Chamomilla recutita* (L.) Rauschert  
*Chrysanthemum* sp.  
*Cirsium creticum* (Lam.) D'Urv.  
*Crepis foetida* L. (?)  
*Cynara cardunculus* L. (?)  
*Cynara scolymus* L.  
*Dittrichia (Inula) viscosa* (L.)  
 W. Greuter  
*Echinops sphaerocephalus* L.  
*Galactites tomentosa* Moench
- Helichrysum stoechas* (L.) Moench
- Hypochoeris cretensis* (L.)  
 Bory et Chaub.  
*Inula crithmoides* L.  
*Lamyropsis cynaroides* (Lam.) Dittrich
- Notobasis syriaca* (L.) Cass.
- Onopordum bracteatum* Boiss. et Heldr.
- Acanthiophilus helianthi* (Rossi) (FH)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Terellia serratulae* (Linnaeus) (FH)  
*Urophora stylata* (Fabricius) (FHG?)  
*Orellia colon* (Meigen) (FH)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Orellia colon* (Meigen) (FH)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Orellia colon* (Meigen) (FH)  
*Terellia virens* (Loew) (FH)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Urophora stylata* (Fabricius) (FHG?)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Chaetorellia* sp. (FH)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Urophora* sp. cf. *jaceana* (Hering) (FH)  
*Urophora affinis* (Frauenfeld) (FHG?)  
*Trupanea stellata* (Fuessly) (FH)
- Urophora stylata* (Fabricius) (FHG?)  
*Tephritis matricariae* (Loew) (FH)
- Terellia fuscicornis* (Loew) (FH)  
*Myopites stylatus* (Fabricius) (FHG)
- Tephritomyia lauta* (Loew) (FH)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Orellia colon* (Meigen) (FH)  
*Terellia serratulae* (Linnaeus) (FH)  
*Urophora stylata* (Fabricius) (FHG?)  
*Actinoptera mamulae* (Frauenfeld) (SG?)  
*Spathulina sicula* Rondani (SG? Doubtful record)
- Trupanea stellata* (Fuessly) (FH)  
*Tephritis matricariae* (Loew) (FH)
- Myopites lelae?* Diribek (FHG)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Terellia serratulae* (Linnaeus) (FH)  
*Acanthiophilus helianthi* (Rossi) (FH)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Chaetostomella onotrophes* (Loew) (FH)  
*Orellia lappae* (Cederhjelms) (FH)  
*Tephritis postica* (Loew) (FH)

Otanthus maritimus (L.)  
Hoffmanns et Link  
Pallenis spinosa (L.) Cass.  
Phagnalon rupestre (L.) DC  
  
Picnomon acarna (L.) Cass.  
Picris echioides L.  
Ptilostemon gnaphaloides (Cyr.) Soják

Pulicaria dysenterica (L.) Bernh.

Pulicaria odora (L.) Reichenb.  
Reichardia picroides (L.) Roth  
Scolymus hispanicus L.  
Senecio gnaphalodes Sieber  
Stachelina arborea Schreber

Tragopogon longirostris Bischoff ex  
Sch. Bip.  
Xanthium spinosum L.

*Cupressaceae*

Cupressus sempervirens L.

*Ericaceae*

Erica arborea L.

*Fagaceae*

Quercus coccifera L.  
Quercus ilex L.

*Labiatae*

Ballota pseudodictamnus (L.) Bentham

Phlomis fruticosa L.  
Sideritis syriaca L.  
Stachys cretica L.

*Oleaceae*

Olea europaea L.

*Rosaceae*

Prunus cerasus L.  
Pyrus communis L.

Tephritis stictica (Loew) (FH)

Capitites ramulosa (Loew) (FH)  
Spathulina sicula Rondani (SG)  
Chaetostomella onotrophes (Loew) (FH)  
Tephritis vespertina (Loew) (FH)  
Chaetostomella onotrophes (Loew) (FH)  
Terellia sabroskyi Freidberg (FH)  
Urophora neuenschwanderi Freidberg  
(FHG)

Myopites apicatus Freidberg (FHG)  
Myopites zernyi Hering (FHG)  
Myopites zernyi Hering (FHG)

Acanthophilus helianthi (Rossi) (FH)  
Sphenella marginata (Fallén) (FH)  
Urophora neuenschwanderi Freidberg  
(FH)

Orellia falcata (Scopoli) (ST)

Euaresta bullans (Wiedemann) (FR)

Aciura coryli (Rossi) (FL?)  
Katonaiia hemileopsis (Hering) (FL?)  
Aciura coryli (Rossi) (FL?)  
Aciura coryli (Rossi) (FL?)  
Aciura coryli (Rossi) (FL?)

Dacus oleae (Gmelin) (FR)

Rhagoletis cerasi (Linnaeus) (FR)  
Ceratitis capitata (Wiedemann) (FR)

### Rutaceae

Citrus paradisi Macf.	Ceratitis capitata (Wiedemann) (FR)
Citrus reticulata Blanco	Ceratitis capitata (Wiedemann) (FR)
Citrus sinensis (L.) Osb.	Ceratitis capitata (Wiedemann) (FR)

### Umbelliferae

Smyrniurn perfoliatum L.	Euleia heraclei (Linnaeus) (LE)
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