

## A CONTRIBUTION TO THE KNOWLEDGE OF THE EPHYDROIDEA (DIPTERA: CAMILLIDAE, CAMPICHOETIDAE AND DROSOPHILIDAE) OF MALTA.

Martin J. Ebejer<sup>1</sup>

### ABSTRACT

The families of Ephydroidea, which to date are known to occur in Malta, are the Camillidae, Campichoetidae, Drosophilidae and Ephydriidae. The first three are reviewed and an annotated list of species is given. None of the species have been previously recorded from Malta. The Ephydriidae are the subject of a separate study to be published elsewhere.

### INTRODUCTION

The families which are currently included in the Ephydroidea are the Camillidae, Campichoetidae, Curtonotidae, Diastatidae, Drosophilidae and Ephydriidae (Mathis & Zatwarnicki, 1998; Papp, 1998a, 1998b). The Ephydriidae of Malta are the subject of a separate study (Gatt & Ebejer, in prep.). Neither Diastatidae nor Curtonotidae have been found in Malta to date. Therefore, this article deals with the remaining three families, the Camillidae, Campichoetidae and Drosophilidae.

There are no published studies of these families relating to species occurring in the Maltese Islands. Earlier workers (Cilia, 1973; Rondani, 1856-1880; Saliba, 1963 and Schembri *et al.*, 1991) who dealt with Maltese Diptera did not record any species of Ephydroidea save a few in the family Ephydriidae. In Table I, data is given on the fauna of Malta relative to regional and global faunas of the families of Ephydroidea. This information is based on Chandler (1998a, 1998b), Cogan (1984), Bächli (1998); Bächli *et al.* (1995), Bächli & Rocha Pité (1984), Mathis & Zatwarnicki (1998),

Papp (1984a, 1984b, 1984c, 1998a, 1998b).

The biology and ecology of the Camillidae are poorly known. Adults are frequently observed on flowers but the larval stages of most species are unknown. Barraclough (1998), while studying the Afrotropical species, reared them from faecal pellets in arid environments. Ferrar (1987), summarising the little that was previously known, states that they have been reared from soil at the entrance of small mammal burrows. Recently, Kirk-Spriggs & Barraclough (1998) described the larva of one cavernicolous species. There are no records of early stages of Maltese species.

The Campichoetidae (Chandler, 1998a) are uncommon flies associated with dark, humid woodland. The early stages and developmental history are unknown. The habits of adults are equally unknown save that they fly very close to the ground.

By comparison, the Drosophilidae are a well-studied group although this does not apply to Malta. Other than one occasion, which is recorded below, there have been no attempts to trap Drosophilidae using bait known to be highly

Table I The Ephydroidea of Malta compared to the world fauna and that of the Palaearctic, the Mediterranean and Sicily. (Numbers refer to the number of species in each family known from the particular region or country.)

Family	Worldwide	Palaearctic	Mediterranean	Sicily	Malta
Camillidae	37	11	4	0	2
Campichoetidae	10	7	5	0	1
Curtonotidae	60	2	2	0	0
Diastatidae	39	11	3	0	0
Drosophilidae	3500	364	45	17	13
Ephydriidae	1750	505	200	66	50

<sup>1</sup> 14, Triq Sigismondo Dimech, Balzan BZN 08, Malta.

attractive to these flies, for example, fruit and yeast mixture or beer, wine and vinegar. Baited trapping in wooded areas and orchards may reveal more species. Ferrar (1987) summarises their diverse biology. Most are saprophagous, feeding on microorganisms (usually yeasts) growing in fermenting fruits and decaying vegetation, whereas a few are leaf miners. Some genera (not found in Malta) contain a number of species that are entomophagous, attacking mainly Hemiptera (Aleyrodidae and Pseudococcidae). There are many instances of specialization within the Drosophilidae, especially in the tropics.

## MATERIAL AND METHODS

Unless otherwise indicated, all species here recorded were collected by the author and are preserved in his private collection. Most of the material is preserved dry-mounted. Where it is preserved in alcohol, this is stated after the respective data. Identification was based on Chandler (1987), Bächli & Burla (1985) and Papp (1985).

## ANNOTATED LIST OF SPECIES

### CAMILLIDAE

#### *Camilla acutipennis* (Loew, 1865)

Material examined: 1♂, Chadwick Lakes, 30.i.1977; 1♀, Ghajn Rihana, 10.ii.1977; 2♂♂, Wied Incita, 4.iii.1991; 2♂♂, Marfa Ridge, 22.iii.1992; 1♂, Chadwick Lakes, 8.xi.1992; 3♂♂ and 3♀♀, Wied l-Isqof, Rabat, 15.xi.1992; 1♂, il-Qolla, Bidnija 7.iii.1999; 1♂, Marfa Ridge, 30.i.2000.

This is a fairly common species, which is often taken when sweeping low vegetation in the shade of trees. It can be observed also on flowers of *Ceratonia*, *Foeniculum*, *Ferula*, *Dacus* and *Euphorbia*.

**Distribution:** Mediterranean, from Spain across North Africa and southern European countries to Israel.

#### *Camilla nigrifrons* Collin, 1933

Material examined: 1♂, Għgant, 3.iii.1991; 1♂ and 1♀, Gozo, Għarb, Wied il-Mielah, 30.xi.1991; 4♂♂, Gozo, Mgarr ix-Xini, 23.iv.1992; 7♂♂ and 3♀♀, Mgħbah, 9.xi.1997; 1♂, Wied l-Isqof, Rabat, 3.v.1998; 1♀, Tal Handaq, Qormi, 7.i.1999.

This species is common and widespread on Malta and Gozo, especially near lush vegetation. It can occur in large numbers under *Ceratonia* during the flowering season. It is sometimes found on the same flowers as its congener.

**Distribution:** Britain, Hungary, Malta and Spain.

### CAMPICHOETIDAE

#### *Campichoeta grandiloba* McAlpine JF, 1962

Material examined: 1♂, Buskett, 29.xii.1998.

This is a rare species in Malta. It has only been found at Buskett. Species of this family are never taken in large numbers.

**Distribution:** Spain, including Balearic islands, Malta and Tunisia.

### DROSOPHILIDAE

#### *Drosophila busckii* Coquillett, 1901

Material examined: 2♀♀, Balzan, 3.ii.1977; 1♂ and 1♀, Marfa Ridge, 10.vii.1987; 2♂♂, Balzan, 4.iii.1992; 1♂ and 1♀, Fiddien, 15.iv.1992; 1♂ and 2♀♀, Gozo, Għasri, 26.ii.1995, C. Farrugia; 1♂, Mgħbah, 9.xi.1997; 1♂ and 2♀♀, Wied Babu, 6.iii.1998.

Though frequent in wooded areas, gardens and indoors, it is not usually found in large numbers. It is nevertheless a widespread species. Mr Charles Farrugia (pers. comm.) reared it from the frass of *Psylliodes* sp. (Coleoptera, Chrysomelidae) on the petioles and in the stems of cauliflower, *Brassica oleracea* var. *botrytis*. Dr Paul Gatt (pers. comm.) reared it from an unidentified species of fungus collected at Mīzieb on 8.xii.1993. Larvae pupated on 22.xii.1993 and adults emerged on 31.xii.1993; from decomposing mushrooms on 1.xii.1993, Rabat and from rotting potatoes on 27.v.1992, Rabat.

**Distribution:** sub-cosmopolitan.

#### *Drosophila buzzatii* Patterson & Wheeler, 1942

Material examined: 1♂, Balzan, 6.iii.1976; 1♂ and 1♀, Fiddien, 17.vi.1992; 2♂♂ and 2♀♀, Wied l-Isqof, Rabat, 3.v.1998.

Generally found near *Opuntia* where it breeds in its fallen fruit and rotting stems.

**Distribution:** sub-cosmopolitan.

#### *Drosophila hydei* Sturtevant, 1921

Material examined: 3♀♀, Balzan, 9-13.vi.2001, baited trap in citrus garden (preserved in alcohol).

In Malta, this species is probably more common and widespread than the above record suggests. It can easily be mistaken for *repleta* or *buzzatii*.

**Distribution:** cosmopolitan.

#### *Drosophila immigrans* Sturtevant, 1921

Material examined: 1♂, Balzan 3.iii.1976; 1♀, Balzan, 8.ii.1977; 1♂, Buskett, 14.iv.1977; 4♂♂ and 2♀♀, Balzan, 9.iii.1992; 1♂ and 1♀, Fiddien, 17.vi.1992; 3♂♂ and 1♀, Buskett, 27.iii.1994; 1♂, Wied Babu, 6.iii.1998; 37 ex., ♂♂ & ♀♀, Balzan, 9-13.vi.2001, baited trap in citrus garden (preserved in alcohol).

This species is relatively large. It is very common in citrus orchards and gardens where it can be abundant on fallen damaged fruits. It frequently enters houses.

**Distribution:** sub-cosmopolitan.

#### *Drosophila melanogaster* Meigen, 1830

Material examined: 3♂♂, Balzan, 9-13.vi.2001, baited trap in citrus garden (preserved in alcohol).

Older records represented by dry material are not listed, as it

is very difficult to separate this species from *simulans* without dissection. Much less frequent than *simulans*, the two species share the same habits and biotopes. Detailed phenological and ecological studies may uncover differences in the habits of these species in Malta.

**Distribution:** cosmopolitan.

***Drosophila repleta*** Wollaston, 1858

Material examined: 1♂, Balzan, 14.xii.1976; 1♂, Sliema, 2.1.1977; 1♂ and 5♀♀, Balzan, 1.ix.1991; 1♀, Wied Babu, 6.iii.1998; 1♂ & 2♀♀, Balzan, 9-13.vi.2001, baited trap in citrus garden (preserved in alcohol).

This is a common species, which sometimes occurs indoors where it is attracted to fruit or beer.

**Distribution:** cosmopolitan.

***Drosophila simulans*** Sturtevant, 1919

Material examined: 32 ♂♂ (and 27♀♀, *melanogaster/simulans*) Balzan, 9-13.vi.2001, baited trap in citrus garden (preserved in alcohol). (See note under *melanogaster*.)

Abundant wherever fruit is overripe or damaged. It is often found in very large numbers in gardens.

**Distribution:** cosmopolitan.

***Drosophila subobscura*** Collin, 1936

Material examined: 1♂ and 2♀♀, Buskett, 1.v.1992; 1♂, Buskett, 9.vii.1993; 3♂♂ and 1♀, Wied il-Mistra, 19.iii.1994; 1♂, Buskett, 3.v.2001; 1♂ and 1♀, Balzan, 9-13.vi.2001, baited trap in citrus garden.

Common in wooded areas and gardens; it is the author's observation that, at least in Malta, it seems to be attracted to fruit in smaller numbers than other species.

**Distribution:** most of Europe, the Mediterranean including North Africa, the Middle East and South America.

***Hirtodrosophila cameraria*** (Haliday, 1833)

Material examined: 1♀, Buskett, 14.iv.1977.

This is apparently a rare species in Malta, the above being the only known record.

**Distribution:** most of Europe, the Mediterranean, and parts of the Middle East.

***Lordiphosa andalusiaca*** (Strobl, 1906)

Material examined: 1♀, Wied il-Kbir, Qormi, 20.ii.1977; 1♂ and 1♀, Salina, 16.iv.1977; 1♂, Gozo, Ramla dunes, 23.iv.1992; 4♂♂ and 5♀♀, Fiddien, 17.vi.1992; 1♀, Bahrija, 12.vi.1994, J.W. Ismay; 1♀, Buskett, 3.v.2001.

In Malta, it appears to be a rather uncommon and localised

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species usually found in undergrowth near *Arundo*.

**Distribution:** widespread in Europe, the Mediterranean, North Africa and the Middle East.

***Scaptomyza adusta*** (Loew, 1862)

Material examined: 3♂♂ and 4♀♀, Gozo, Wied il-Mielah, Gharb, 30.xi.1991; 1♂ and 1♀, Wied Qannotta, 16.xii.1995; 1♂, Fiddien, 28.i.2001; 1♂, Buskett, 3.v.2001.

Introduced from North America into the Mediterranean, where it is now naturalised in many places. In Malta it appears to be increasing as it is encountered more often and in new habitats.

**Distribution:** North America, Mediterranean.

***Scaptomyza pallida*** (Zetterstedt, 1847)

Material examined: 1♂ and 1♀, Wied is-Sewda, 12.ii.1977; 1♀, Wied il Kbir, Qormi, 20.ii.1977; 2♀♀, Madliena, 31.xii.1979; 2♂♂ and 2♀♀, Marfa Ridge, 3.i.1987; 3♂♂ and 1♀, Wied Qannotta, 4.i.1987; 3♂♂ and 1♀, Marfa Ridge, 5.i.1987; 2♂♂ and 2♀♀, Wied Incita, 5.i.1987; 4♂♂, Fawwara, 2.iii.1991; 2♂♂, Gozo, Wied il-Mielah, Gharb, 30.xi.1991.

A very common and widespread species; it is one of the most frequently encountered flies in winter. It is often seen on *Bellis*, *Euphorbia*, *Reichardia* and many Umbelliferae.

**Distribution:** cosmopolitan.

***Zaprionus tuberculatus*** Malloch 1932

Material examined: 3♂♂, Girgenti, 20.xi.1991; 4♂♂ and 4♀♀, Fiddien, 21.ix.1994; 2♀♀, Buskett, 27.xi.1994; 1♂ and 3♀♀, Mgiebah, 9.xi.1997; 1♀, Wied Babu, 6.iii.1998.

A very common species in Malta especially in citrus orchards, it can be found all year round. Dr Paul Gatt (pers. comm.) took this species at light in October 1994 and reared it from the fruits of *Opuntia* taken at Fiddien on 21.ix.1994.

**Distribution:** Afrotropical region, extending into the Mediterranean and Arabia.

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