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

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ABSTRACT

The families of Ephydroidea, which to date are known to occur in Malta, are the Camillidae, Campichoetidae, Drosophilidae and Ephydridae. The first three are reviewed and an annotated list of species is given. None of the species have been previously recorded from Malta. The Ephydridae 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 Ephydridae (Mathis & Zatwamicki, 1998; Papp, 1998a, 1998b). The Ephydridae 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 Ephydridae. 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 Pite (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 attractive.

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.)

<table>
<thead>
<tr>
<th>Family</th>
<th>Worldwide</th>
<th>Palaearctic</th>
<th>Mediterranean</th>
<th>Sicily</th>
<th>Malta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camillidae</td>
<td>37</td>
<td>11</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Campichoetidae</td>
<td>10</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Curtonotidae</td>
<td>60</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diastatidae</td>
<td>39</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Drosophilidae</td>
<td>3500</td>
<td>364</td>
<td>45</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Ephydridae</td>
<td>1750</td>
<td>505</td>
<td>200</td>
<td>66</td>
<td>50</td>
</tr>
</tbody>
</table>

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), Bachli & Burla (1985) and Papp (1985).

ANNOTATED LIST OF SPECIES

CAMILLIDAE

Camilla acutipennis (Loew, 1865)


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


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


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 Mizieb 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


Generally found near Opuntia where it breeds in its fallen fruit and rotting stems. Distribution: sub-cosmopolitan.

Drosophila hydei Sturtevant, 1921


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


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


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


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

**Distribution:** cosmopolitan.

*Drosophila simulans* Sturtevant, 1919


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

**Distribution:** cosmopolitan.

*Drosophila subobscura* Collin, 1936


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)


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)


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

**REFERENCES**


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*Scaptomyza adusta* (Loew, 1862)


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)


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


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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