Provisional atlas of the lacewings and allied insects (Neuroptera, Megaloptera, Raphidioptera and Mecoptera) of Britain and Ireland

Colín W Plant
The Institute of Terrestrial Ecology (ITE) is a component research organisation within the Natural Environment Research Council. The Institute is part of the Terrestrial and Freshwater Sciences Directorate, and was established in 1973 by the merger of the research stations of the Nature Conservancy with the Institute of Tree Biology. It has been at the forefront of ecological research ever since. The six research stations of the Institute provide a ready access to sites and to environmental and ecological problems in any part of Britain. In addition to the broad environmental knowledge and experience expected of the modern ecologist, each station has a range of special expertise and facilities. Thus, the Institute is able to provide unparalleled opportunities for long-term, multidisciplinary studies of complex environmental and ecological problems.

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The Biological Records Centre is operated by ITE, as part of the Environmental Information Centre, and receives financial support from the Joint Nature Conservation Committee. It seeks to help naturalists and research biologists to co-ordinate their efforts in studying the occurrence of plants and animals in the British Isles, and to make the results of these studies available to others.

Mr C W Plant
Newham Museum Service
The Visitor Centre
East Ham Nature Reserve
Norman Road, East Ham
LONDON E6 4HN
081 470 4525

Biological Records Centre
Institute of Terrestrial Ecology
Monks Wood
Abbots Ripton
HUNTINGDON
Cambs PE17 2LS
04873 (Abbots Ripton) 381
Provisional atlas of the lacewings and allied insects (Neuroptera, Megaloptera, Raphidioptera and Mecoptera) of Britain and Ireland

Colin W Plant
(Newham Museum Service, formerly the Passmore Edwards Museum)

Edited for the Biological Records Centre
by Paul T Harding, Brian C Eversham and Henry R Arnold

Biological Records Centre
NERC Institute of Terrestrial Ecology
Monks Wood
Huntingdon
Citation information:

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</table>
The four orders of insects covered in this Atlas have traditionally been studied together, even though the Mecoptera are not particularly closely related to the other three orders. This small group of just over 70 British and Irish species is of no great economic importance in this country (though some species are used as biological control agents elsewhere in the world), neither do they have the aesthetic appeal of, say, the Lepidoptera, yet they have long been a popular group to collect and study. This interest in an apparently insignificant group may well have been stimulated by Killington's two-volume work on the Neuroptera published over 50 years ago by the Ray Society, and this monograph is still considered a model of its kind.

The first Neuroptera recording scheme began in the 1970s, but unhappily it proved to be a false start, and the resultant records are no longer available. Fortunately, Colin Plant agreed to set up a new scheme in 1988, and his enthusiasm and hard work have achieved striking results in a very short time. In just four years we have gained a great deal of up-to-date information on the distribution and status of nearly all the British and Irish species, thanks to the combination of a dynamic new recording scheme and a stimulating newsletter, which has a circulation of nearly 150 copies. Four species have been reported as new to the British list since the new recording scheme began, and one has been removed.

This is a Provisional Atlas, and our knowledge of the British and Irish species will certainly be refined over the next few years, but there is no doubt that the hard work of Colin Plant, coupled with that of the staff of the Biological Records Centre, has produced a new milestone in the study of lacewings in Britain and Ireland.

Peter Barnard December 1993
INTRODUCTION

Lacewings are one of the more familiar and easily recognised groups of insects. In some countries, they are regarded to be of considerable economic importance as predators of aphids. Yet in Britain and Ireland we know little about the species which occur here, and the ecological importance and potential economic value of our lacewing fauna are scarcely acknowledged by ecologists, agronomists or foresters. The term 'lacewing' is used here in a broad sense, to cover all the orders included in this Atlas.

The Lacewing Recording Scheme

In an attempt to establish a baseline of information on the lacewings of Britain and Ireland, the Lacewing Recording Scheme was set up by the author, in collaboration with the Biological Records Centre. The Scheme was set up to examine and document the composition and distribution of the fauna of Britain and Ireland, and to record information on the phenology, voltinism and habitat preferences of each species.

The Lacewing Recording Scheme started in April 1988 after failure to revitalise an earlier data gathering operation which had been launched in 1977. The present Scheme was launched with the first issue of the newsletter, Neuro News, and a newly designed recording card. Initial fears that such a small group of insects, which were supposed to be difficult to identify and would not find great popularity, were soon dispelled. The newsletter circulation list now contains nearly 150 names and, although not all are or ever will be active recorders for the Scheme, it is a good measure of the interest in this group in Britain and Ireland.

The recording card

The new recording card (RA 68) (Figure 1) was designed with several intentions. Simple distribution data (including detailed site-relatable information), whilst being the principal objective of the Scheme, are not the only information required from the work of the recorders. The existing literature on several species is vague regarding aspects such as larva/plant associations and adult phenology, and the card was designed to aid the recording of such information. In addition, many species seem to have been regarded as rare, mainly because they had not been recorded by traditional collecting methods. Therefore, the card was designed to gather information on the collecting method used to obtain records, in
an attempt to see if any patterns of occurrence and collecting methods would emerge.

This combined approach to recording has resulted in new information on species such as *Psectra diptera*. This species was considered to be very rare, but has proved to be quite widespread in England and Wales, a fact which has been revealed through extensive use of pitfall traps and water traps in grassland habitats.

Whilst wishing to gather this additional information, it was important to keep the card as simple and easy to use as possible. Furthermore, it was important to include, on a single card, the 72 species then known from Britain and Ireland. The result was a balance between these and other considerations, and the card has served the Scheme well.

Unless otherwise stated, all of the data concerning habitats, capture methods and adult flight period originate from completed RA68 cards received between April 1988 and November 1992, to the exclusion of previously published information, much of which cannot be substantiated.
## Figure 1. RA68 record card - front and reverse

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<th>H2</th>
<th>C1</th>
<th>C2</th>
<th>Sex</th>
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<td>H2</td>
<td>C1</td>
<td>C2</td>
<td>Box</td>
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<td><strong>Mecoptera G43</strong></td>
<td>01. Boreus hyemalis</td>
<td>02. Gasteroptera cognata</td>
<td>03. Gasteroptera geraesica</td>
<td>04. Megaloptera G43B</td>
<td>05. <strong>L. Panorpa cogneta</strong></td>
<td>06. <strong>L. Raphidia cognata</strong></td>
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<td>01. Coppice</td>
<td>02. Coppice with standards</td>
<td>03. Clear felled</td>
<td>04. Face</td>
<td>05. Field</td>
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<td>06. Park</td>
<td>07. Field level</td>
<td>08. Forest level</td>
<td>09. Forest level</td>
<td>10. Gorse</td>
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<td>31. <strong>Inside building</strong></td>
<td>32. <strong>Dry</strong></td>
<td>33. <strong>Wet</strong></td>
<td>34. <strong>Ponds and lakes</strong></td>
<td>35. <strong>Ponds and lakes</strong></td>
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<td>36. <strong>Allotment</strong></td>
<td>37. <strong>Town park</strong></td>
<td>38. <strong>Cemetary</strong></td>
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<td>41. <strong>Collected in flight</strong></td>
<td>42. <strong>Aquatic larva found</strong></td>
<td>43. <strong>Water trap</strong></td>
<td>44. <strong>Pitfall trap</strong></td>
<td>45. <strong>Fishing box</strong></td>
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<td>46. <strong>Light trap</strong></td>
<td>47. <strong>Moth trap</strong></td>
<td>48. <strong>Baited box</strong></td>
<td>49. <strong>Baited box</strong></td>
<td>50. <strong>Baited box</strong></td>
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<td>51. <strong>Other, please specify</strong></td>
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**Sexes** Enter one or more codes against each species |

**Biodiversity Records Centre** April 1983
IDENTIFICATION

Two English language publications are potentially available to neuropterists working on the fauna of Britain and Ireland.

F J Killington's *Monograph of the British Neuroptera*, published by the Ray Society in two volumes in 1936 and 1937, is a useful work and contains some helpful identification keys. Unfortunately, it has been out of print for many years and is only rarely available from specialist second-hand book sellers. However, this work is weak in certain areas, notably the Coniopterygidae, and the Megaloptera, Raphidioptera and Mecoptera are not included. It should also be noted that, since its publication, several additional species have been recognised amongst the existing lacewing fauna, and these cannot be differentiated using Killington's *Monograph*.

The second work is the volume by F C Fraser, *Neuroptera, Megaloptera and Mecoptera* in the series of *Handbooks for the identification of British insects*, published by the Royal Entomological Society of London in 1959. Unfortunately, this work is afflicted with a number of ambiguities and errors and it too is out of print.

For those entomologists who read German, the publication *Die Neuropteren Europas* (Äspöck, Äspöck & Hölzel 1980) is certainly the best text. Even for those who do not read German, the two-volume work is still important for the drawings of genitalia, the European distribution maps and other data. The Raphidioptera have also been described in the German language; *Die Raphidiopteren der Erde* (Äspöck, Äspöck & Rausch 1991) is in two volumes. Both works are very expensive.

Thus, anyone working on the British/Irish lacewings does not have ready access to up-to-date literature in English. It is hoped that a new version of the Royal Entomological Society's *Handbook* will be prepared in the not too distant future. Dr Peter Barnard, whose responsibilities at the Natural History Museum have included curation of the lacewing collections, has already produced a number of provisional keys, which have appeared in *Neuro News* to enable some field testing to take place. Other works, on identification of the Coniopterygidae and of female Panorpa species, have recently been published in the entomological literature, whilst several aids to identification have appeared in *Neuro News*.

Table 1 is a guide to the various
<table>
<thead>
<tr>
<th>Taxonomic group and stage</th>
<th>Recommended text for identification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Megaloptera</strong> (adults)</td>
<td>Barnard (1977)</td>
</tr>
<tr>
<td></td>
<td>Genitalia drawings in <em>Neuro News</em> 4</td>
</tr>
<tr>
<td><strong>Megaloptera</strong> (larvae)</td>
<td>Elliott, O'Connor and O'Connor (1979)</td>
</tr>
<tr>
<td><strong>Raphidioptera</strong> (adults)</td>
<td>Provisional key by Barnard and discussion by Plant in <em>Neuro News</em> 2. Genitalia drawings in Aspöck et al (1991) – includes keys to other European species (in German)</td>
</tr>
<tr>
<td><strong>Neuroptera</strong></td>
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<tr>
<td>Coniopterygidae (adults, to species)</td>
<td>Plant (1991a)</td>
</tr>
<tr>
<td></td>
<td>Plant (1992) – addition of <em>Semidalis pseudouncinata</em></td>
</tr>
<tr>
<td>Hemerobiidae (adults, to genus)</td>
<td>Provisional key by Barnard (1990a) in <em>Neuro News</em> 5</td>
</tr>
<tr>
<td>Hemerobiidae (larvae, to genus)</td>
<td>Veenstra, Feichter and Gepp (1990)</td>
</tr>
<tr>
<td>Wesmaelius (adults, to species)</td>
<td>Provisional key by Barnard (1990b) in <em>Neuro News</em> 6</td>
</tr>
<tr>
<td>Chrysopidae (adults, to species)</td>
<td>Provisional key by Barnard (1990c) in <em>Neuro News</em> 7</td>
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<td></td>
<td>notes by Plant in <em>Neuro News</em> 8</td>
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<td>Sisyridae (adults, to species)</td>
<td>Elliott (1977)</td>
</tr>
<tr>
<td>Remaining Neuroptera (adults)</td>
<td>Fraser (1959), Killington (1936–37)</td>
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<td><strong>Mecoptera</strong></td>
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<tr>
<td>Panorpidae (adult males)</td>
<td>Fraser (1959) illustrates genital capsules, redrawn in <em>Neuro News</em> 3</td>
</tr>
<tr>
<td>Panorpidae (adult females)</td>
<td>Plant (1991c)</td>
</tr>
</tbody>
</table>

**Confirmation of identifications**

The author is always willing to examine specimens for other entomologists or institutions. These should be sent, carriage paid to:

C W Plant,  
The Visitor Centre,  
East Ham Nature Reserve,  
Norman Road,  
London E6 4HN.  

Only specimens which are accompanied by full data (minimum information required – year collected, locality and collector’s name) will be
examined. By prior arrangement, the author is prepared to examine specimens without data for those intending to develop a comparative collection.

Sources of the data set

No records are available from the data gathering exercise which preceded the present Recording Scheme. The present Atlas is, therefore, compiled from data submitted to the Scheme since April 1988. These data are supplemented by records derived from collections at museums (see Appendix 1), which the author has examined, either on loan or by visiting the museums in question.

To these records must be added others from the entomological literature: a list of journals researched is given in Appendix 2. Two major published sources of data have been those of Morgan (1976) for Wales, and Barnard, O’Connor and Speight (1991) for Ireland.

Another major source of records has been the light traps operated under the auspices of the Rothamsted Insect Survey. Through the kindness of the staff at the Rothamsted Experimental Station and the efforts of the trap operators, a large number of monthly samples of lacewings have been received from 66 traps for the period 1988–91. These traps are located throughout Great Britain and the Channel Islands, with one locality in Ireland (Figure 2).

Validation of records

Validation – making sure that all the records are ‘good’ records – has not been a problem, but it has taken time. It has been approached in two ways. First, every effort has been made to ensure that lacewings have been correctly identified and, second, steps have been taken to detect and correct the inevitable errors. Incorrect data can arise as a result of accidental errors in completing recording cards and mistakes in entry of the data on to the computer. There have been remarkably few errors, but in order to make this assurance, each of the 14 094 records which make up the data set have required checking individually.

To ensure that identifications were correct, a set of rules has been rigorously applied, and the author is very grateful for the co-operation received from contributors, some of whose records may have been rejected. Nomenclatural changes, splitting of species, the raising to species status of former subspecies and recent advances in methods for identification have provided much amusement for those long winter evenings. Clearly, it was both unreasonable and impossible to insist on personal examination of every specimen. Therefore, the first stage was to draw up a list of
Figure 2. Distribution of Rothamsted Insect Survey light traps from which monthly samples have been received (1988–91)
Table 2. Species requiring confirmation by experienced entomologists

<table>
<thead>
<tr>
<th>Species</th>
<th>Nature of difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemerobius contumax</td>
<td>Rare species</td>
</tr>
<tr>
<td>H. fenestratus</td>
<td></td>
</tr>
<tr>
<td>H. perelegans</td>
<td></td>
</tr>
<tr>
<td>Megalomus hirtus</td>
<td></td>
</tr>
<tr>
<td>Nothochrysa fulviceps</td>
<td></td>
</tr>
<tr>
<td>Sisyra dali</td>
<td></td>
</tr>
<tr>
<td>Chrysopa abbreviata</td>
<td>Identity confused in Fraser (1959)</td>
</tr>
<tr>
<td>C. commata</td>
<td></td>
</tr>
<tr>
<td>C. phyllochroma</td>
<td></td>
</tr>
<tr>
<td>Mallada prasina</td>
<td>M. prasina raised to species status</td>
</tr>
<tr>
<td>M. ventralis</td>
<td></td>
</tr>
<tr>
<td>Coniopterygidae (all species)</td>
<td>Genitalia examination of males essential (see Plant 1991a)</td>
</tr>
<tr>
<td>Hemerobius simulans</td>
<td>Frequently confused with H. humulinus</td>
</tr>
<tr>
<td>Wesmaelius spp. (females)</td>
<td>Examination of genital plates essential</td>
</tr>
<tr>
<td>Panorpa spp.</td>
<td>Females separable only on genitalia (see Plant 1991c).</td>
</tr>
<tr>
<td>Raphidioptera (all species)</td>
<td>Fraser (1959) is unreliable for some specimens, particularly of Subilla confinis and Xanthostigma xanthostigma</td>
</tr>
<tr>
<td>Sialis spp.</td>
<td>Examination of genitalia essential</td>
</tr>
</tbody>
</table>

species which present problems of identification or nomenclature (Table 2). Records of these species were accepted only from entomologists with experience of the group. Records of these selected species, submitted by persons of unknown ability, were verified either by the author or by another entomologist of known experience, always involving examination of voucher specimens.

The second part of the validation has involved careful scrutiny of every card received. Common errors included transposed northings and eastings in the grid reference, incorrect 100 km square references, incorrect vice-county numbers and dates in the wrong sequence. All cards have been examined, and where necessary corrected. As a further safeguard against rogue grid references, the data set was validated at BRC using a computer routine which searches for incompatibility between the grid reference and vice-county.

The complete data set was printed out from the computer and checked manually against the recording cards to eliminate any entry errors, although only 0.25% of the 14 094 records had keyboarding errors.
Following this checking and validation, a draft set of distribution maps was printed from the BRC computer; these were examined for such things as lacewing records in the middle of the North Sea (there were a couple!). Any record which did not fit the general pattern for the species was then recalled from the data base, and checked by referring back to the original recorder with a request to see the specimen. If no specimen existed, and there was a real cause for doubt about the validity of the identification, the record was rejected.

Finally, complete print-outs of all records from selected English and Scottish vice-counties, for all of Wales and all of Ireland were generated from the computer and disseminated to various regional specialists for scrutiny. The errors thus detected were so few, and so inconsequential, that it was agreed generally that the data set was fully validated.

**Vice-county records**

The occurrence of species in the Watson/Praeger biological vice-counties of Britain and Ireland has been reviewed as part of the preparation of this Atlas. Many of the known vice-county records are not included on the distribution maps as 10 km square records, because many old specimens in museums have data labels with insufficient information to be able to allocate records even to 10 km squares. Similarly, literature records often have only imprecise data. Wherever possible, original specimens have been examined before records have been accepted.

It is evident from reviewing the vice-county records that Surrey is the place to go to record lacewings. There are 63 species on the county list, 53 of them recorded since the end of 1979; most of the species missing from the Surrey list are found only in Scotland. It is not clear whether this remarkably high total reflects a county which is genuinely good for lacewings, or whether it results from many notable entomologists living or collecting in the county. Surrey is a topographically and ecologically varied county, but it is also a favoured area for collecting.

In Table 3, the numbers of species recorded in vice-counties with a total of 40 or more species are compared.

There are experienced entomologists living in all of these areas, but interesting comparisons exist. South Essex, where the author has been most active during the last ten years, has 38 species since 1979. Doubtless there are more species to find, but the county is considered to be fairly well covered. For the last seven years
Table 3. Comparison of the number of species recorded in selected vice-counties

<table>
<thead>
<tr>
<th>Vice-county Name (number)</th>
<th>Number of species recorded since 1899</th>
<th>Since 1979</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surrey (17)</td>
<td>63</td>
<td>61</td>
</tr>
<tr>
<td>South Hampshire (11)</td>
<td>53</td>
<td>51</td>
</tr>
<tr>
<td>Hertfordshire (20)</td>
<td>50</td>
<td>49</td>
</tr>
<tr>
<td>Berkshire (22)</td>
<td>49</td>
<td>46</td>
</tr>
<tr>
<td>Staffordshire (39)</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>S.W. Yorkshire (63)</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>Dorset (9)</td>
<td>44</td>
<td>41</td>
</tr>
<tr>
<td>Caernarvonshire (49)</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>South Devon (3)</td>
<td>41</td>
<td>36</td>
</tr>
<tr>
<td>Middlesex (21)</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>West Kent (16)</td>
<td>41</td>
<td>27</td>
</tr>
<tr>
<td>South Essex (18)</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Bedfordshire (30)</td>
<td>40</td>
<td>39</td>
</tr>
</tbody>
</table>

There are large areas of Britain and Ireland where field work is urgently needed. There are no records, for any period in history, for the Scottish vice-counties of Renfrewshire, or North Ebudes, or the Irish vice-counties of Limerick, North Tipperary, East Mayo, Fermanagh or Londonderry. There are no recent (post-1979) records from Kincardineshire, North Aberdeenshire, Mid Ebudes or West Sutherland or for 19 of the 40 Irish counties.

the author has lived in Hertfordshire, which has 41 species since 1979. Hertfordshire is not well recorded, and most records have come either from the author's garden light trap or from the Rothamsted Insect Survey light trap at a garden in Harpenden. In spite of this very uneven coverage, the numbers of species recorded in the two vice-counties are remarkably similar, which suggests that either Hertfordshire will prove to have more species than South Essex or both counties have an approximately similar fauna. Only time, and more field work, will provide an answer. Another question which one could reasonably ask is why the vice-county which contains the New Forest (South Hampshire) has ten fewer species than Surrey.
SYNONYMIC CHECKLIST

A revised checklist of the Neuroptera was published by Barnard (1978), but this does not cover the Megaloptera, Raphidioptera or Mecoptera. Although Barnard’s list includes several generic synonyms, the combinations of genus names and specific epithets are not fully synonymised. Also, there have been many changes in nomenclature since 1978, whilst a total of four new species has been added, and one more is deleted from the list in this Atlas. In the following checklist, complete synonyms have been incorporated, including a number (affecting British/Irish species) used only in the foreign literature. Awareness of such synonyms is essential if use is being made of the world literature for identification and study of the biology of species.

A revised synonymic checklist of the Neuroptera, Megaloptera, Raphidioptera and Mecoptera of Britain and Ireland

RAPHIDIOPTERA

RAPHIDIIDAE Navás 1916

SUBILLA Navás 1916

confinis (Stephens 1836)

- Raphidia confinis Stephens 1836
- Raphidia cognata Rambur 1842
- Raphidia schneideri Ratzeburg 1844
- Raphidia colubroides Costa 1855
- Raphidia sericea Albarda 1891

ATLANTORAPHIDIA Aspóck & Aspóck 1968

maculicollis (Stephens 1836)

- Raphidia maculicollis Stephens 1836
- Raphidia ophiopsis Curtis 1824, partim, nec auctt.
- Raphidia affinis Stephens 1836
- Raphidia centrodes Navás 1915

PHAEOSTIGMA Navás 1909

notata (Fabricius 1781)

- Raphidia notata Fabricius 1781
- Raphidia ophiopsis Curtis 1824, partim, nec auctt.
- Raphidia megacephala Stephens 1836
- Raphidia media Burmeister 1839
- Raphidia angustata Ratzeburg 1844
- Raphidia laticeps Wallengren 1871

ERMA abdita Navás 1918

Lesna navasi Steinmann 1963

Lesna stigmata Steinmann 1963

Lesna laticapat Steinmann 1963

Navasana perubrata Steinmann 1963

XANTHOSTIGMA Navás 1909

xanthostigma (Schummel 1832)

- Raphidia xanthostigma Schummel 1832
- Raphidia londinensis Stephens 1836
- Raphidia chalybocephala Ratzeburg 1844
- Raphidia schummeli Girard 1864
- Raphidilla germanica Steinmann 1964
- Raphidilla rapax Steinmann 1964
- Agulla trilobata Bartos 1965
- Agulla rostrata Bartos 1965

MEGALOPTERA

SIALIDAE Leach 1815

SIALIS Latreille 1803

lutaria (Linnaeus 1758)

Hemerobius lutarius Linnaeus 1758

Sialis flavilatera Kolbe 1880

fuliginosa Pictet 1836

fusconebulosa Imms 1934 nomen nudum

nigripes Pictet 1865
NEUROPTERA

CONIOPTERYGOIDEA Burmeister 1839
CONIOPTERYGIDAE Burmeister 1839
CONIOPTERYGINAE Burmeister 1839

CONWENTZIA Enderlein 1905

psociformis (Curtis 1834)
   Coniopteryx psociformis Curtis 1834
   Coniopteryx aphidiformis Rambur 1842

pineticola Enderlein 1905
   Coniopteryx reticulata Tullgren 1906
   Conwentzia angulata Navás 1914
   Conwentzia axillata Navás 1914
   Conwentzia cryptoneuris Bagnall 1915
   Conwentzia hageni Banks 1906
   Conwentzia psociformis (Curtis 1834) f. pineticola sensu Killington 1936

CONIOPTERYX Curtis 1834

subgenus CONIOPTERYX Curtis, 1834
tineiformis Curtis 1834, nec Burmeister 1839
   Malacomyzia lactea Wesmael 1836
   Sciodus fuscus Zetterstedt 1840
   Sciodus lacteus, Wesmael 1840
   borealis Tjeder 1930
   parthenia (Navás & Marcet 1910)
      Deasia parthenia Navás & Marcet 1910
   Coniopteryx pygmaea auctt., nec
      Enderlein 1906

subgenus METACONIOPTERYX Kis, Nagler & Mandru 1970
   esbenpeterseni Tjeder 1930
   lentiae Aspöck & Aspöck 1964

SEMDALIS Enderlein 1905

aleyrodidiformis (Stephens 1836)
   Coniopteryx aleyrodidiformis Stephens 1836
   Coniopteryx tineiformis Burmeister 1839, nec Curtis 1834
   Semidalis aleyrodidiformis Lucas 1927
      (mis-spelling)
   Semidalis curtisiana Enderlein 1906
   Semidalis albata Enderlein 1907
   Semidalis alpina Withycombe 1925
   Semidalis poincianae Withycombe 1925
   pseudouncinata Meinander 1963

PARASEMDALIS Enderlein 1905

fuscipennis (Reuter 1894)
   Coniopteryx fuscipennis Reuter 1894
   Parasemidalis annae Enderlein 1905

ALEUROPTERYGINAE Enderlein 1905

ALEUROPTERYX Löw 1885
   juniperi Ohm 1968

OSMYLOIDEA Leach 1815

OSMYLIDAE Leach 1815

OSMYLUS Latreille 1802

fulvicephalus (Scopoli 1763)
   Hemerobius fulvicephalus Scopoli 1763
   Hemerobius maculatus Fabricius 1787
   Hemerobius laurifoliiformis Razoumowsky 1789
   Osmylius maculatus Latreille 1802
   Osmylius chrysops Hagen 1858, nec
      Linnaeus 1758

SISYRIDAE Handlirsch 1908

SISYRA Burmeister 1839

fuscata (Fabricius 1793)
   Hemerobius fuscatus Fabricius 1793
   Hemerobius confinis Stephens 1836
   Hemerobius nitidulus Stephens 1836, nec
      Fabricius 1777, nec Walker 1853
   Sisyrus morio Burmeister 1839
   Sisyrus nigripennis Wesmael 1841
   Branchiotoma spongillae Westwood 1842
   Hemerobius fumatus Motschulsky 1853
   dalii McLachlan 1866
   Hemerobius nitidulus Walker 1853, nec
      Fabricius 1777, nec Stephens 1836
   Sisyrus dalei Navás 1935 (mis-spelling)
   terminalis Curtis 1854

MYRMELEONTOIDEA Latreille 1803

MYRMELEONOIDEA Latreille 1803

MYRMELEONTIDAE Latreille 1803

MYRMELEONINAE Latreille 1803

EUROLEON Esben-Petersen 1918

nostras (Fourcroy 1785) [Channel Islands only]
   Myrmeleon nostras Fourcroy 1785
MYRMELEON Linnaeus 1767
formicarius Linnaeus 1767

HEMEROBOIOIDEA Latreille 1803

HEMEROBIIDAE Latreille 1803

PSECTRA Hagen 1866

diptera (Burmester 1839)
  Hemerobius dipterus Burmeister 1839
  Hemerobius delicatulus Fitch 1856
  Psectra buenoi Navás 1909
  Notiobiella galloisi Navás 1924

MICROMUS Rambur 1842
variegatus (Fabricius 1793)
  Hemerobius variegatus Fabricius 1793
  Micromus pulchellus Nakahara 1915
angulatus (Stephens 1836)
  Hemerobius aphidivorus Schrank 1781
  Hemerobius angulatus Stephens 1836
  Hemerobius villosus Zetterstedt 1840
  Hemerobius intricatus Wesmael 1840
  Micromus tendinosus Rambur 1842
  Hemerobius lineatus Goszy 1852
  Micromus jonas Needham 1905
  Eumicromus angulatus (Stephens) Killington 1936
  Nesomicromus angulatus (Stephens) Fraser 1959
paganus (Linnaeus 1767)
  Hemerobius paganus Linnaeus 1767
  Hemerobius nemoralis Stephens 1836
  Micromus ineosus Rambur 1842
  Hemerobius elegans Goszy 1852, nec Stephens 1836
  Eumicromus alpinus Nakahara 1915
  Eumicromus paganus (Linnaeus) Killington 1936
  Nesomicromus paganus (Linnaeus) Fraser 1959

HEMEROBIUS Linnaeus 1758
humulinus Linnaeus 1761
  Hemerobius humuli Linnaeus 1761, nec Zetterstedt 1840
  Hemerobius subfasciatus Stephens 1836
  Hemerobius crispus Stephens 1836, nec Walker 1853
  Hemerobius apicalis Stephens 1836
  Hemerobius obscurus Stephens 1836
  Hemerobius affinis Wesmael 1840, nec Stephens 1836
  Hemerobius maculatus Wesmael 1836
  Mucropalpus lutescens (Fabricius 1793) in Rambur 1842
  Hemerobius obliteratus Walker 1853
  Hemerobius castaneae Fitch 1855
  Hemerobius castaneae (mis-spelling) Fitch 1855
  Hemerobius tutatrix Fitch 1855
  Hemerobius gossypii Ashmead 1895
  Hemerobius algonquinus Banks 1924
  Hemerobius obtusus Nakahara 1954
  peralegans Stephens 1836
simulans Walker 1853
  Hemerobius crispus Walker 1853, nec Stephens 1836
  Hemerobius stigmaterus Fitch 1855
  Hemerobius orotypus Wallengren 1870
  Hemerobius nevadensis Banks 1904
  Hemerobius placidus Banks 1908
  Hemerobius piceus Navás 1925
stigma Stephens 1836
  Hemerobius irroratus Stephens 1836
  Hemerobius strigosus Zetterstedt 1840
  Hemerobius limbatellus Zetterstedt 1840, partim
  Hemerobius limbatius Wesmael 1841
  Hemerobius crassus Walker 1853, nec Stephens 1836
  Hemerobius stigmaterus Fitch 1855
  Hemerobius stephensii Fitch 1855
  Hemerobius phaleratus Hagen 1858
  Hemerobius moestus Banks 1897, nec Hagen 1854
  Hemerobius dyari Currie 1904
  Hemerobius simplex Banks 1905
  Hemerobius buyssoni Navás 1909
  Hemerobius periphericus Navás 1913
atirifrons McLachlan 1868
  Hemerobius fasciatus Goszy 1852, nec Stephens 1836
pini Stephens 1836, nec Leach
  Hemerobius fasciatus Stephens 1836, nec Goszy, 1852
  Hemerobius suecicus Möberg 1909
  Hemerobius phaleratus Hagen 1858 (part)
contumax Tjeder 1932
  Hemerobius limbatellus (Zetterstedt 1840), partim
fenestraus Tjeder 1932
  Hemerobius limbatellus (Zetterstedt 1840), partim
**nitidulus** Fabricius 1777
**Hemerobius humuli** Zetterstedt 1840 partim, nec auctt.
**Hemerobius ochraceus** Wesmael 1840
**Mucropalpus obscurus** Rambur 1842
**Hemerobius haematicus** Navás 1908

**micans** Olivier 1792
**Hemerobius punctatus** Stephens 1836, nec Goszy 1852
**Hemerobius pallidus** Stephens 1836
**Hemerobius lutescens** Burmeister 1839, nec auctt.

**Mucropalpus fuscinervis** Schneider 1845
**Mucropalpus irroratus** Costa 1855

**lutescens** Fabricius 1793, nec auctt.
**Hemerobius affinis** Stephens 1836 partim, nec Wesmael 1840
**Hemerobius peganus** Stephens 1836, nec Linnaeus 1767

**marginatus** Stephens 1836
**Hemerobius lutescens** Zetterstedt 1840, nec auctt.
**Hemerobius flexuosus** Hagen 1858
**Hemerobius humuli** Zetterstedt 1840 partim, nec auctt.
**Hemerobius irregularis** Nakahara 1915

**WESMAELIUS** Krüger 1922
**subgenus KIMMINSIA** Killington 1937
**malladai** (Navás 1925)
**Hemerobius malladai** Navás 1925
**Boriomyia mortoni** (McLachlan 1899)
**Kimminsia killingtoni** Fraser 1942
**mortoni** (McLachlan 1899)
**Hemerobius mortoni** McLachlan 1899
**Boriomyia enontekienisi** Klingstedt 1929
**Boriomyia enontekienisi** Klingstedt 1930 (wrong date)

**ravus** (Withycombe 1923)
**Boriomyia rava** Withycombe 1923
**Kimminsia rava** (Withycombe 1923)
**Kimminsia killingtoni** Killington 1937
**balticus** (Tjeder 1931)
**Boriomyia baltica** Tjeder 1931
**Kimminsia baltica** (Tjeder 1931)
**Kimminsia killingtoni** Killington 1937

**betulinus** (Ström 1788)
**Hemerobius betulinus** Ström 1788
**Hemerobius nervosus** Fabricius 1793
**Kimminsia nervosa** (Fabricius 1793)
**Kimminsia killingtoni** Killington 1937
**Hemerobius nebulosus** Stephens 1836 partim
**Hemerobius conspersus** Burmeister 1839
**Mucropalpus distinctus** Rambur 1842
**Hemerobius disjunctus** Banks 1897
**Boriomyia nervosa** (Fabricius) Banks 1906
**Boriomyia betulina** (Ström) Esben-Petersen 1925
**Hemerobius frostinus** Navás 1933
**Kimminsia cinerea** Nakahara 1960
**Kimminsia melaleuca** Nakahara 1965
**Kimminsia alexanderi** Nakahara 1965

**subnebulosus** (Stephens 1836)
**Hemerobius subnebulosus** Stephens 1836
**Kimminsia subnebulosa** (Stephens 1836)
**Kimminsia killingtoni** Fraser 1942

**marginatus** Stephens 1836
**Hemerobius conspersus** Burmeister 1839
**Hemerobius hirtus** Burmeister (nec Linnaeus) 1839
**Hemerobius cylindripes** Wesmael 1841
**Hemerobius atomarius** Goszy 1852
**quadriifasciatus** (Reuter 1894)
**Hemerobius concinnus** Stephens 1836 var. quadriifasciatus Reuter 1894
**Boriomyia quadriifasciata** (Reuter) Banks 1906

**SYMPHEROBIUS** Banks 1904
**elegans** (Stephens 1836)
**Hemerobius elegans** Stephens 1836, nec Goszy 1852
**Hemerobius marshami** Stephens 1836
**Hemerobius beckwithii** Stephens 1836
**Hemerobius paucinervis** Zetterstedt 1840
**Hemerobius striatellus** Klapalek 1905
**Sympherobius venustus** Navás 1908
**Sympherobius vicentei** Navás 1914
**Nefasitus catalaunicus** Navás 1930

**pygmaeus** (Rambur 1842)
**Mucropalpus pygmaeus** Rambur 1842
**Hemerobius coccocephagus** Goszy 1852
**Micromus pumilio** Stein 1863
**Sympherobius venosus** Navás 1908
**Sympherobius conspersus** Navás 1908
**Sympherobius lambereti** Navás 1910
Sympherobius bellus Navás 1911
Sympherobius menendezi Navás 1913
Sympherobius melanogaster Navás 1915
Sympherobius fortini Lacroix 1924
Nefasitus italicus Navás 1932
Sympherobius laetus Steinmann 1967
pellucidus (Walker 1853)
    Hemerobius pellucidus Walker 1853, nec Wallengren 1871
Sympherobius carpathicus Kis 1965
fuscescens (Wallengren 1863)
    Hemerobius fuscescens Wallengren 1863
    Hemerobius pellucidus (Walker 1853) in Wallengren 1871
    Hemerobius obscurellus Zetterstedt 1840
    Hemerobius inconspicuus McLachlan 1868
    Niremberge limpida Navás 1909

MEGALOMUS Rambur 1842
hirtus (Linnaeus 1761)
    Hemerobius hirtus Linnaeus 1761
    Hemerobius fimбриatus Curtis 1828
    Hemerobius decussatus Leach cf Hagen 1866

DREPANEPTERYX Leach, 1815
DREPANOPTERYX Burmeister 1839
phalaenoides (Linnaeus 1758)
    Hemerobius phalaenoides Linnaeus 1758

CHRYSOPIDAE Schneider 1851
CHRYSOPINAE Schneider 1851

CHRYSOPA Leach 1815
abbreviata Curtis 1834
    Chrysopa immaculata Stephens 1836
    Chrysopa chlorophanus Ratzeburg 1844
    Chrysopa germanica Esben-Petersen 1913
phyllochroma Wesmael 1841
    Chrysopa pusilla Brauer 1850
    Chrysopa tenella Brauer 1850
    Chrysopa abbreviata Schneider 1851
        partim, nec Curtis 1834
    Chrysopa peterseni Navás 1910
    Chrysopa magnicaua Tjeder 1936
commata Kis & Ujhelyi 1965
perla (Linnaeus 1758) nec Stephens 1836, nec Evans 1848
    Hemerobius perla Linnaeus 1758
    Hemerobius chrysopa Fabricius 1775, nec Linnaeus 1758

CHYSOPERLA Steinmann 1964
carnea (Stephens 1836)
    Chrysopa carnea Stephens 1836
    Chrysopa affinis Stephens 1836
    Chrysopa microcephala Brauer 1850
    Chrysopa vulgaris Schneider 1851
    Chrysopa plorabunda Fitch 1856
    Chrysopa lampropter Stein 1863
    Chrysopa lucasina Lacroix 1912
    Chrysopa pillichi Pongracz 1913
    Chrysopa nipponensis Okamoto 1914
    Chrysopa kurikai Okamoto 1914
** Chrysopa kolthoffi Navás 1927
    Chrysopa angelina Navás 1931
    Chrysopa quettana Navás 1931
    Chrysopa downesi Smith 1932
    Chrysopa igerina Navás 1933
    Chrysopa pictavica Lacroix 1933
    Chrysopa renoni Lacroix 1933
    Chrysopa sinica Lacroix 1933
    Chrysopa mohave Banks 1938
    Chrysopa canariensis Tjeder 1939
    Chrysopa lundbladi Tjeder 1939
    Chrysopa maderensis Tjeder 1939

CHRYSOPIDIA Navás 1910
ciliata (Wesmael 1841)
    Chrysopa ciliata Wesmael 1841

* Now regarded as having full specific status by Leraut (1991)
** Now regarded as having full specific status by Leraut (1992)
Chrysotropia ciliata (Wesmael 1841)
Chrysotropia lacroixi Navás 1911
Chrysopa japonica Nakahara 1915
Chrysopa linensis Navás 1916
Chrysopa melaneura Navás 1916
Chrysopa alba Lacroix 1924, nec aute.

CUNCTOCHRYSIA Hözel 1970
albineata (Killington 1935)
Chrysopa albolineata Killington 1935
Chrysopa tenella Schneider 1851, nec

MALLADA Navás 1925
flavifrons (Brauer 1850)
Chrysopa flavifrons Brauer 1850
Anisochrysa flavifrons (Brauer 1850)
Chrysopa lineolata McLachlan 1880
Chrysopa narcissina Navás 1910
Chrysopa luteola Navás 1915
prasina (Burmeister 1839)

Chrysopa prasina Burmeister 1839
Chrysopa aspersa Wesmael 1841
Hemerobius prasinus (Burmeister)
Rambur 1842
Chrysopa coerulea Brauer 1850
Chrysopa zelleri Schneider 1851
Hemerobius ramburii Costa 1855
Chrysopa mariana Navás 1905
Chrysopa sachalinensis Matsumura 1911
Chrysopa nikkoensis Okamoto 1914
Chrysopa caucasica Navás 1914
Chrysopa burri Navás 1914
Chrysopa ventralis Curtis 1834 f. prasina
sensu Killington 1937
Anisochrysa prasina (Burmeister) Ressl
1971
ventralis (Curtis 1834)
Chrysopa ventralis Curtis 1834
Anisochrysa ventralis (Curtis 1834) Hözel
1970

NINETA Navás 1912
flava (Scopoli 1763)

Hemerobius flavus Scopoli 1763
Chrysopa perla Stephens 1836 partim,
nec Linnaeus 1758
Chrysopa subfalcata Stephens 1836
Chrysopa viitata Schneider 1851, nec
Wesmael 1841
Chrysopa viitata Brauer 1857, nec
Wesmael 1841

vittata (Wesmael 1841)

Hemerobius albus Fabricius 1775, nec
Linnaeus 1758
Chrysopa perla Stephens 1836 partim,
nec Linnaeus 1758
Chrysopa alba Burmeister 1839, nec
Linnaeus 1758
Chrysopa viitata Wesmael 1841
Hemerobius proximus Rambur 1842
Chrysopa alba Brauer 1851, nec Linnaeus
1758
Chrysopa integra Hagen 1852
Chrysopa olivacea Gerstaecker 1893
Chrysopa inornata Matsumura 1911
Chrysopa inornatella Nakahara 1914
Chrysoscera viitata (Wesmael) Lacroix
1924

NOTHCHRYSINAE Navás 1910

NOTHCHRYSIA McLachlan 1868
capitata (Fabricius 1793)
Hemerobius capitatus Fabricius 1793
Chrysopa capitata (Fabricius) Stephens
1834
Nathanica capitata (Fabricius) Navás 1913
fulviceps (Stephens 1836)
Chrysopa fulviceps Stephens 1836
Hemerobius erythrocephalus Rambur
1842
Nathanica fulviceps (Stephens) Navás 1913

MECOPTERA

BOREIDAE McLachlan 1868

BOREUS Latreille 1825
hyemalis (Linnaeus 1767)
Panorpa hyemalis Linnaeus 1767
Panorpa proboscideus Panzer 1796
Boreus gigas Brauer 1876 nomen nudum

PANORPIDAE Leach 1815

PANORPA Linnaeus 1758
cognata Rambur 1842
Panorpa alpina Hagen 1858, nec Rambur
1842
Panorpa ghilianii McLachlan 1869
Panorpa subalpina Navás 1927
Panorpa osellai Willmann 1976
communis Linnaeus 1758

Panorpa affinis McLachlan 1869
Panorpa raehlei Lauterbach 1970

germanica Linnaeus 1758

Panorpa affinis Leach 1815
Panorpa apicalis Stephens 1836
Panorpa borealis Stephens 1836
Panorpa montana Brauer 1857
Panorpa gibberosa McLachlan 1869
Panorpa ruizi Navás 1926
Panorpa riegeri Lauterbach 1971
DISTRIBUTION MAPS AND SPECIES ACCOUNTS

Recording coverage

Map 1 shows the 10 km squares from which records have been received. This map includes records from all sources. The map also serves as a guide to areas from which there are no records, where surveys are essential before the data base can be updated and further maps produced.

To be able to provide information to aid species and site conservation, it is important to know which species are present at this time, rather than which species were recorded at some time in the past. Map 2 summarises the numbers of species recorded from each 10 km square during the period 1980–92. This map shows groupings of well-recorded squares, and reflects the intensity of recording by a few active entomologists rather than the distribution patterns of species. Such bias in recording, which is inevitable in the early stages of a scheme, will be reduced as more records are received.

Total number of validated records

As a result of the validation of records described earlier, many records, mainly from early published sources, have been eliminated from the data set. The full data set, as summarised in this Atlas, consists of the following:

- Total number of records from before 1900: 438
- Total number of records from 1.1.1900 to 31.12.1979: 6173
- Total number of records from 1.1.1980 to 15.11.1992: 7483
- Overall total number of validated records: 14 094

Species accounts

The species accounts, with few exceptions, include the following sections.

Distribution and status

General statements are given on the occurrence and status of species. There has been some confusion of terms used to define range with terms which define abundance. In these accounts, the terms widespread and local are used to refer to the range of a species as summarised in the distribution map. The terms common and rare refer to the status of the species, effectively its abundance at the regional or national scale. Therefore, it is possible for a rare species to be widespread, but equally possible for a species to have a local distribution and to be common.
Map 1  Neuroptera - recorded squares

- All records
Map 2  Neuroptera – number of species per square
1980–92

- 11–32
- 6–10
- 1–5
Table 4. The Standard Weeks used to tabulate and analyse adult flight periods

<table>
<thead>
<tr>
<th>Week No</th>
<th>Dates</th>
<th>Week No</th>
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<th>Week No</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 Jan–7 Jan</td>
<td>14</td>
<td>2 Apr–8 Apr</td>
<td>27</td>
<td>2 Jul–6 Jul</td>
<td>40</td>
<td>1 Oct–7 Oct</td>
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<td>5</td>
<td>29 Jan–4 Feb</td>
<td>18</td>
<td>30 Apr–6 May</td>
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<td>30 Jul–5 Aug</td>
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<td>6</td>
<td>5 Feb–11 Feb</td>
<td>19</td>
<td>7 May–13 May</td>
<td>32</td>
<td>6 Aug–12 Aug</td>
<td>45</td>
<td>5 Nov–11 Nov</td>
</tr>
<tr>
<td>10</td>
<td>5 Mar–11 Mar</td>
<td>23</td>
<td>4 Jun–10 Jun</td>
<td>36</td>
<td>3 Sep–9 Sep</td>
<td>49</td>
<td>3 Dec–9 Dec</td>
</tr>
</tbody>
</table>

Habitat

The comments summarise information from recorders, compiled on completed RA68 recording cards, supplemented by personal observations and, in some cases, published information. However, published information which was considered to be imprecise, or based on supposition, has been omitted.

Collecting

It is essential to collect specimens for reliable identification of almost every species. Collecting methods found to be appropriate for individual species are noted, but reliance on one or a few methods will inevitably lead to some species being overlooked.

Season

There is little published information on the phenology of lacewings. Data from completed record cards provide the first large-scale set of information on the phenology of species in Britain and Ireland. Although much of this information is fragmentary, results are summarised for all species. In some cases the data have been allocated to standard weeks (see Table 4).

Distribution maps

A distribution map is included for all but the rarest species. The following symbols are used on the species maps:

- Recorded prior to 1900, but not since
- Recorded since 1900, but not since 1979
- Recorded during the period 1980–92
The Raphidioptera (snakeflies) are separated from the Megaloptera _sensu stricto_ (with which they were formerly grouped), partly on the life history of the larvae: Raphidioptera have larvae which are terrestrial, whereas the larvae of Megaloptera are aquatic. Adult snakeflies are characterised by their enormously elongated pronota, from which the English name is derived.

The distinctive ovipositor of the female is used to deposit eggs in the cracks of bark on either standing trunks or fallen logs. The larvae are predatory on beetle larvae, especially Tenebrionidae, and probably on other larvae, such as those of Diptera. They are, however, rather inactive and seem not to hunt their prey actively. In British species, the life cycle is over two years and larvae can be parasitised by Ichneumonidae. Pupation takes place either in debris at the foot of the tree or in loose bark or debris on the surface. Emergence is usually synchronised in _Atlantoraphidia maculicollis_ (and is likely to be so in the other British species) so that there is a mass emergence of adults over a short period of time. Mating usually takes place immediately after emergence and the adult snakeflies then ascend to the tree tops where they remain, feeding on aphids, larvae of micro-lepidoptera and other small insects, seldom descending unless blown by strong winds.

**Identification**

Most specimens can be reliably identified using the key in Fraser (1959), but this does not deal fully with the variation within each species. In _A. maculicollis_, the vein R is sometimes forked at its distal end. The pterostigma of _Subilla confinis_ is typically yellow, not dark brown to black as stated by Fraser, which has led to several museum examples of _S. confinis_ being misidentified as _Xanthostigma xanthostigma_. Revised keys have been published in *Neuro News* 2, and by Aspöck _et al._ (1991) (see Table 1).

Four species are currently known in Britain, but they are poorly recorded, especially in Scotland, and it is possible that at least one species may remain as yet undiscovered there. There are no records of snakeflies in Ireland. The classification of the Raphidioptera has recently undergone major revision and our four species are no longer considered to belong to the single genus _Raphidia_, but all belong to the family Raphidiidae.
Map 3  *Subilla confinis* (Stephens 1836)
**Subilla confinis** (Stephens 1836)

**Distribution and status**

This species is local and uncommon and has been recorded sparsely from the southern Midlands, East Anglia, and the south of England. Whether this apparent distribution is genuine is difficult to discern because, like the other three British species of Raphidioptera, it is mainly arboreal as an adult and is rarely collected.

**Habitat**

Fraser (1959) states that its habits and habitats are similar to those of *A. maculicollis*, which is confined to pine (*Pinus* spp.) and larch (*Larix* spp.) plantations. At present, there is insufficient reliable information to confirm the accuracy of that statement. Errors in Fraser’s key and the difficulty experienced by many entomologists in determining species may have led to mistakes in attributing habitats to species.

**Collecting**

Like all the snakeflies, *S. confinis* is most easily found low on the trunks of trees, where teneral examples will be found sitting for a short period immediately after emergence. Information on the species of trees on which this species is found is needed. Sweeping of vegetation adjacent to suitable trees soon after strong winds can also be rewarding. Any Scottish specimens, apparently of this species, should be checked to eliminate *Raphidia ophiopsis* – a very similar species not yet recorded in Britain.

**Season**

It overwinters as a larva. Adult records are from weeks 19 to 34, with a peak in week 23.
Map 4  Atlantoraphidia maculicollis (Stephens 1836)
*Atlantoraphidia maculicollis* (Stephens 1836)

**Distribution and status**

This species has a localised distribution, but may be common where it occurs. It is apparently absent from the Channel Islands and Ireland. The range in Britain appears disjunct, which may be real because the species seems to be restricted to large conifer plantations. The preponderance of southern records is a result of recorder bias. Fraser (1959) regards *A. maculicollis* as '... our commonest species; may be found emerging in numbers at the foot of pine trees during early May'. Whilst the species is indeed plentiful where it occurs, its distribution is by no means as general as that of *X. xanthostigma*.

**Habitat**

Where information was given, all records were directly related to, or associated with, pines or larches.

**Collecting**

One of the best ways to find this species is to look for adults sitting at the ends of pine branches on sunny days in early May (W R B Hynd pers. comm.). It has also been taken by beating pine and larch foliage, and in malaise traps. Larvae have been found under the loose bark of fallen pine logs.

**Season**

It overwinters as a pupa. The adult flight period is from May to July, with a distinct peak in June.
Map 5  *Phaeostigma notata* (Fabricius 1781)
**Phaeostigma notata (Fabricius 1781)**

**Distribution and status**

It is probably widespread and common wherever oaks (*Quercus* spp.) occur in England. It has not yet been recorded from the west country, western Wales, Scotland, and the Channel Islands, probably a result of under-recording.

**Habitat**

This, our largest species of snakefly, appears to be confined to oaks. The larvae are alleged to be predators of beetle larvae, under the bark of fallen logs or stumps.

**Collecting**

The adults are strictly arboreal, but sweeping vegetation soon after stormy weather seems to be an effective method of capture. In Essex, adults have been beaten from oak trees at 6 metres above ground level, by standing on deer-shooting platforms constructed in the trees. There is a single record of an adult in a pitfall trap in June.

**Season**

It overwinters as a larva. The main adult flight period is in late May and June.
Map 6 Xanthostigma xanthostigma (Schummel 1832)
**Xanthostigma xanthostigma** (Schummel 1832)

**Distribution and status**

This species is widespread and locally common. Misidentifications as other species are partly responsible for the alleged rarity of the insect in earlier British publications. It has not yet been recorded from the Channel Islands, the south-west, western Wales, Scotland or Ireland.

**Habitat**

There seems to be no evidence to support Fraser's statement that this species is confined to willows (*Salix* spp.), but neither are there sufficient data to be able to suggest what its habitat may be. Many present-day records relate to oaks.

**Collecting**

Sweeping vegetation in woodlands, particularly after high winds, has produced several records. Two adults were beaten from oak and a larva was found under flaking bark of an oak log in March. One adult was taken in a pitfall trap in April.

**Season**

It overwinters as a larva. The main adult flight period is in June.
MEGALOPTERA

Alderflies are familiar and distinctive insects, which are typically associated with the marginal vegetation of rivers, lakes and ponds. They have no particular association with alder (Alnus glutinosa) trees.

The greyish egg masses are laid on emergent vegetation or, more rarely, on inorganic objects at the waterside. The larvae emerge after 7 to 14 days and fall or crawl to water. The eggs of Sialis lutaria are frequently parasitised, but no reliable data are available for the other two species. The larvae are truly aquatic and are predatory on a range of invertebrates. The larval stage lasts for two years in Britain, but, in high-altitude lakes abroad, the larval stage often spans three winters (Elliott 1977). The pupa is formed in a chamber which the larva digs about 1 cm down in waterside debris; after about three weeks the mobile pupa climbs emergent vegetation and the adult emerges. Emergence of adults is frequently synchronised, and it is not unusual to encounter several hundred teneral adults resting on waterside vegetation.

Identification

Until recently, only two species of Megaloptera: Sialidae were recognised in Britain and one in Ireland. The discovery of Sialis nigripes in 1976 (Barnard 1977) has placed in question earlier records, until such time as voucher material can be examined. For this reason, the distribution maps exclude a large number of older records. For correct determination, the genitalia of males or the anal plates of females must be examined. These features are illustrated, for all three species, by Barnard (1977) and in Neuro News 4. The best key to the early stages is that of Elliott et al. (1979), whilst Barnard (1977) illustrates the distinctive eggs of S. nigripes.
Map 7  *Sialis fuliginosa* Pictet 1836
**Sialis fuliginosa** Pictet 1836

**Distribution and status**

This species is widespread, but rather locally distributed; it has an extensive range which suggests that it is under-recorded. There are no records from Ireland or the Channel Islands.

**Habitat**

All records are from flowing water and, though most are from fast-flowing streams and rivers, there are some from slow-moving water bodies. Torrents appear unsuitable for this species. A factor common to all the sites for which information is available is clean, clear water with an absence of silt. The pH of the water does not seem to be important.

**Collecting**

Almost all records are of adults taken at rest or swept from waterside vegetation. Others were beaten from various trees or bushes close to water or were taken in malaise traps in wetlands. The species has not, so far, been recorded using light traps.

**Season**

The larvae leave water to pupate from late April to June (Elliott 1977) and the main adult flight period runs from May to July, with a peak in June.
Map 8  *Sialis lutaria* (Linnaeus 1758)
**Sialis lutaria (Linnaeus 1758)**

**Distribution and status**

*S. lutaria* is widespread and common throughout Britain, as far north as Orkney. It also occurs in Ireland, but is not recorded from the Channel Islands.

**Habitat**

This species is recorded from both static and moving water bodies: from small village ponds to large lakes and from small streams to major rivers. Where the flow of water is rapid, records all relate to small backwaters or side channels where the flow is slower. Common factors at sites where this species occurs are the presence of emergent vegetation and a bottom deposit of mud or silt. There are some records from heavily turbid rivers. Because of the difference in habitat requirements, *S. lutaria* often occurs in the absence of the other two species. However, there are several records of both *S. lutaria* and *S. fuliginosa* occurring together and two records, both from Wales, of all three species together.

**Collecting**

Adults are most frequently recorded at rest on emergent vegetation, from which they are easily picked up or swept. Beating waterside trees and bushes also produced many records. One adult was taken on a yellow sticky trap at a wetland in Suffolk, and there are two records from light traps. Malaise traps in wetlands are also productive, but water traps seem ineffective.

**Season**

The adult flight period runs from early April to early August with a single marked peak in May and June.
Map 9  *Sialis nigripes* Pictet 1865
Sialis nigripes Pictet 1865

The wing venation characters of this species are frequently intermediate between those of S. lutaria and S. fuliginosa. Examination of the genitalia is the only reliable method of determination of this or any other Sialis species in Britain and Ireland.

Distribution and status

The first record published was that made by Martin Speight in Co Westmeath in 1976 (Barnard 1977). However, subsequent examination of museum specimens (labelled as the other Sialis species) has revealed that S. nigripes has occurred in both Ireland and Britain since at least 1867. Nevertheless, it seems to be genuinely more rare than the preceding two species, and so far has been reported only in small numbers.

Two Yorkshire records cited by Kirby (1991), from the River Derwent and the River Ribble, are not mapped because it has not been possible to locate the records to 10 km squares. A recent record from Norfolk is not mapped because it is unconfirmed.

Habitat

The Irish records suggest that S. nigripes is associated with calcareous rivers and lakes (O'Connor & O'Grady 1990). However, other records are from rivers of different character, such as the Tywi and Taf in Wales, where Ian Morgan found all three Sialis species together during 1991. Here the pH of the water is neutral and the bottom a mixture of sand and silt. Kaiser (1950) suggests that wide, open rivers are preferred by S. nigripes. Fozzard and Clelland (1981) provide data on bottom type, flow rates and macrophytes present (but not pH values) for the River Forth in Scotland where both S. nigripes and S. lutaria occur together. There are, as yet, insufficient data to be able to characterise the habitat requirements of this species.

Season

The adult flight period is in May and June.
The original Linnean order 'Neuroptera' included many groups, such as caddisflies (Trichoptera) and dragonflies (Odonata), which were subsequently considered to be valid orders in their own right. During this century, the Raphidioptera, Megaloptera and Mecoptera have also been separated from the 'Neuroptera' and raised to full order status. The present-day Neuroptera is the grouping which was formerly regarded as the sub-order Planipennia.

Six families of the Neuroptera (lacewings) occur in Britain and Ireland:

1. Coniopterygidae (11 species) – waxflies or dustywings
2. Osmylidae (1 species)
3. Sisyridae (3 species) – spongeflies
4. Myrmeleontidae (1 species plus one on the Channel Islands only) – antlions
5. Hemerobiidae (30 species) – brown lacewings

Although the larvae of most lacewings are terrestrial, a few are amphibious and one or two genera are truly aquatic. The larvae are predatory and some are regarded to be aphid predators of economic significance. Although most adult lacewings are also predatory, again mainly on aphids, some are pollen feeders.
1 CONIOPTERYGIDAE

Members of the family Coniopterygidae (waxflies or dustywings) differ markedly from other lacewings. They are small, none exceeding 8 mm wing span, and generally resemble whiteflies (Hemiptera: Aleyrodidae) which are familiar pests of cultivated plants. However, the characteristic venation of the wings at once distinguishes the waxflies from the practically veinless whiteflies.

Not surprisingly, these minute insects are under-recorded in Britain and Ireland. Both Killington (1936–37) and Fraser (1959) recognised a total of seven British species – one each in the genera Aleuropteryx, Conwentzia, Semidalis and Parasemidalis, and three in the genus Coniopteryx. Later, Meinander (1972) transferred Aleuropteryx lutea to the genus Helicoconis, but the discovery in Britain of Aleuropteryx juniperi (Ward 1970) meant the retention of Aleuropteryx as a British genus. Since then, a second Conwentzia, a second Semidalis and two additional species of Coniopteryx have been added to the list, giving a total of 12 species, although one, Helicoconis lutea, is no longer regarded as having occurred in Britain. Only two species are recorded as occurring in Ireland. A review of the British and Irish species of Coniopterygidae is given by Plant (1991a) and updated by Plant (1992), and the Coniopterygidae of the world are reviewed by Meinander (1990).

Identification

The identification of adult coniopterygids requires examination of the internal genitalia of the male, drawings of which are given by Plant (1991a, 1992). It is probable that additional species have still to be discovered in Britain, and more than the present two species may occur in Ireland. Specimens which look atypical should be checked by reference to the drawings in Aspöck et al. (1980).

The species accounts which follow are based solely on records of males, of which the genitalia have been examined either by me or by another experienced person. A great many records, not validated in this way, have been excluded, such as published records in which the text does not make clear that the genitalia were examined. Recent records, submitted to the Scheme on RA68 cards, where the sex of the insect was either female or not stated, have also been omitted.
Map 10  Conwentzia psociformis (Curtis 1834)
Conwentzia psociformis (Curtis 1834)

Distribution and status

The comments on *C. pineticola* (q.v.), concerning older records, relate also to this species. Examination of specimens in museums has shown most to be *C. psociformis*, perhaps suggesting that this is the commoner of the two species. It is widespread in England, Wales and the Channel Islands, with isolated records from Ireland, but it has not yet been reliably recorded from Scotland. It is under-recorded and will probably prove to be a common species.

Habitat

It has been recorded on many species of native deciduous trees, but never on any species of coniferous tree.

Collecting

Beating the foliage of deciduous trees is the best method of finding this species, with oaks producing most records. It is also frequently attracted to light traps and is very occasionally recorded in malaise traps.

Season

It has a long flight period, from April to September, suggesting that there may be two or more generations.
Map 11  Conwentzia pineticola Enderlein 1905
Conwentzia pineticola Enderlein 1905

Distribution and status

In spite of this being the type species of its genus (Enderlein 1905), both Killington (1936) and Fraser (1959) recognised only Conwentzia psociformis as a British species, regarding C. pineticola as a form of C. psociformis. It was not until recently that the existence of two species in Britain was published (Barnard 1978). Consequently, all previously published records have been disregarded unless supported by male specimens in collections.

C. pineticola is apparently widespread, but under-recorded, in central and south-eastern England and with a single old record from St Andrews, Fifeshire. It has not been reliably recorded in Wales, Ireland or the Channel Islands.

Habitat

It is apparently confined to Scots pine (Pinus sylvestris).

Collecting

All records, where capture details were given, were made by beating the foliage of Scots pines or from light traps in the vicinity of pines.

Season

Adults have been recorded in weeks 27, 31, 33 and 37.
Map 12  Coniopteryx tineiformis  Curtis 1834
Coniopteryx tineiformis Curtis 1834

Distribution and status

This species is widely distributed and often very common throughout England and Scotland, with scattered records from Wales, Ireland and the Channel Islands. It is probably the most widespread Coniopteryx species in Britain.

Habitat

It has been recorded from deciduous and mixed woodland, scrubland, urban parks and suburban gardens. Adults have been recorded mainly from oaks, but also from birch (Betula spp.) and from various ornamental shrubs in parks.

Collecting

Most records have come from light traps. Beating trees and shrubs, both deciduous and coniferous, can also be productive, although there may be no real association with conifers.

Season

The adult flight period extends over 19 weeks (19–37) suggesting that there may be more than one generation, but there appears to be a spring peak (weeks 20–26).
Map 13  Coniopteryx borealis Tjeder 1930
Coniopteryx borealis Tjeder 1930

Distribution and status

At the time of Killington’s monograph in 1936, C. borealis was known only from two specimens collected by Morton in Scotland, at Rannoch, Mid Perthshire, in July 1903 and at Roslin Glen, Midlothian, June 1934. The same records are repeated by Fraser (1959). There is an earlier record from Surrey in 1895; the specimen is in the C A Briggs collection at the National Museum of Wales, but was under the label ‘tineiformis’. Recent records indicate that it is widespread and often common in south-eastern Britain. It has also been recorded from Yarner Wood, Devon, where it is very common, and from the Channel Islands. There are no confirmed records from Ireland or Wales and no recent records from Scotland.

Habitat

It occurs in deciduous woodland, scrub and suburban gardens, but the only specific association recorded is with oaks.

Collecting

Collections from light traps have provided 95% of all records. Beating the foliage of oaks is the only other reported method of capture.

Season

Although there are few data, the season appears long, extending from week 21 to week 37.
Map 14  Coniopteryx parthenia (Navás & Marcet 1910)
Coniopteryx parthenia (Navás & Marcet 1910)

Distribution and status

This species is apparently widespread but local over the whole of Britain, north to Inverfarigaig Forest, East Inverness-shire, but it is not recorded from Ireland and the Channel Islands. It is probably under-recorded, but is less frequently encountered than either *C. tineiformis* or *C. borealis*.

Habitat

Few data are available. Records have been from even-aged conifer plantations and mixed deciduous/coniferous woodland. Males have been beaten from holly (*Ilex aquifolium*) and yew (*Taxus baccata***).

Collecting

It is only occasionally recorded in light traps. As with most others in the family, by day it probably resides in the upper layers of the canopy of trees, thereby making sampling difficult. Beating the foliage of trees, including holly, yew and Scots pine, has produced specimens.

Season

Although there are few data, the season appears long, extending from week 15 to week 37.
Coniopteryx esbenpeterseni Tjeder 1930

(This is 'species A' on the RA68 recording card.)

Distribution and status

This species was first recognised in Britain in 1987 from a Rothamsted light trap sample at Wisley Gardens, Surrey, and subsequently from a light trap in a suburban garden at Harpenden, Hertfordshire in 1989 (Hynd & Plant 1991). At the latter site it is quite common. Subsequent examination of the material at the Natural History Museum, London, by Stephen Brooks, has revealed two old specimens – from Darenth, West Kent, in 1878 and from Croydon, Surrey, in 1881, indicating that, like C. borealis it has been an unacknowledged resident during the last 100 years. Although there are only nine current and two former localities, it could be expected to be more widespread; the species occurs in Norway (Greve 1971) and could, therefore, be expected in Scotland.

Habitat

Not known.

Collecting

In Britain it has been collected only in Rothamsted Insect Survey light traps, which use tungsten filament bulbs, but not yet from mercury vapour light traps.

Season

Adults have been recorded in weeks 19, 22, 24, 25 and 32.
Map 16  Coniopteryx lentiae Aspöck & Aspöck 1964
Coniopteryx lentiae Aspöck & Aspöck 1964

(This species is not on the current RA68 recording card.)

Distribution and status

This species was first recognised in Britain from Wisley, Surrey, in 1986 (Hynd 1989). Subsequently, two examples collected at Box Hill, Surrey, in 1895, were found in the collections of the National Museum of Wales (Plant 1991a). More recently, examples have been found in Rothamsted light trap samples from Harpenden, Hertfordshire; Ham Street, East Kent; Starcross, Devon; and Jersey. Like the preceding species, C. lentiae has remained undetected until very recently and may be less localised than present records suggest.

Habitat

Not known.

Collecting

Recent records have been only from Rothamsted Insect Survey light traps.

Season

Adults have been recorded in weeks 22, 25, 26 and 29.
Map 17  *Semidalis aleyrodiformis* (Stephens 1836)
Semidalis aleyrodiformis (Stephens 1836)

Distribution and status

This species is widespread and probably locally quite common in England. In Scotland there is a recent record at Coldingham Bay, Berwickshire, and there are 19th century records north to Rannoch, Mid Perthshire. It is also known from Jersey and Guernsey. It has apparently not been recorded from Wales or Ireland.

Habitat

It has been recorded from a wide range of native deciduous trees and shrubs.

Collecting

Unlike other coniopterygids, this species is rarely recorded at light. Beating the foliage of deciduous trees is the most productive method of capture.

Season

The adult season spans about three months (weeks 21–32) with a peak in late June and early July.
Map 18  *Semidalis pseudouncinata* Meinander 1963
**Semidalis pseudouncinata Meinander 1963**

(This species is not on the current RA68 recording card.)

**Distribution and status**

This species was first recognised as British among Rothamsted Insect Survey light trap samples from Wisley Gardens, Surrey, and Writtle Agricultural College, North Essex, in 1990 (Plant 1992). It is numerous at both these sites but, to date, has not been recorded elsewhere. In recent years it has been spreading northwards across France (P Leraut pers. comm.) and is almost certainly a recent arrival in Britain.

**Habitat**

Not known. Abroad, it is associated with ornamental conifers of the family Cupressaceae, especially cypress (*Cupressus* spp.) and red-cedars (*Thuja* spp.), as well as with juniper (*Juniperus* spp.).

**Collecting**

All records are from Rothamsted Insect Survey light traps, which employ a 200 watt tungsten filament bulb.

**Season**

It has been recorded singly in May and June, and in numbers between 22 and 27 August.
Map 19  *Parasemidalis fuscipennis* (Reuter 1894)
Parasemidalis fuscipennis (Reuter 1894)

Distribution and status

Scattered records from eastern England, north to Scarborough, North-east Yorkshire, suggest a widespread distribution. There are also recent records from Lancashire and Caernarvonshire. It has not been recorded from Ireland or the Channel Islands.

Habitat

There seems to be an association with pines, especially Scots pine. Like most lacewings, it is an arboreal species, and it is the difficulty of sampling the canopy of pines, rather than the rarity of the insect, which has resulted in so few records. It has, however, also been taken from the canopy of an oak (Barnard, Brooks & Stork 1986) and on a stem of bulrush (Typha latifolia) (Richards 1928).

Collecting

Almost all records were made either by beating Scots pine or in light traps (both mercury vapour and tungsten filament).

Season

Although there is one record from week 13, most are from weeks 21–26, with later records in weeks 27, 31 and 35.
Aleuropteryx juniperi Ohm 1968

Distribution and status

This species is known from only two localities: Box Hill, Surrey, in 1968 and 1969 (Ward 1970) and Silwood Park, Berkshire, in 1966. The latter was erroneously recorded by New (1967) as Helicoconis lutea (see Brooks 1991). The Box Hill site is now somewhat degraded. There is an erroneous statement in Kirby (1991) that A. juniperi has been recorded at other localities, due to a misreading of records of the hemipteran Carulaspis juniperi in Ward (1970).

Habitat

At Box Hill, larvae were collected on native juniper (Juniperus communis) in 1968 and in the following year two adults were beaten from juniper at the same site. At Silwood Park, a single adult was beaten from cypress.

Collecting

Beating or sweeping juniper and cypress foliage are the only methods used successfully so far in Britain.

Season

Adults have been recorded in May and June.
Helicoconis lutea (Wallengren 1871)

Distribution and status

This species is not now considered to occur in Britain. It was recorded as two adults beaten from larch and birch beside the River Wear at Wolsingham, Durham, in July 1915 (Heslop-Harrison 1916). The authenticity of this record has been questioned by Plant (1991a). A putative second record, from Silwood Park, Berkshire, in 1966 (New 1967), was a mis-identified specimen of Aleuropteryx juniperi (Brooks 1991).
This widely distributed family is represented by only two species in Europe, one of which is restricted to the Caucasian Region and the other occurring in western Europe, including Britain and Ireland.

The life history of *Osmylus fulvicephalus* is summarised by Elliott (1977). The larvae live in damp mosses in the splash zone at the edge of rivers and streams, but are not truly aquatic, unlike the larvae of the closely related Sisyridae. The first instar larvae feed on mites and collembolans, but second and third instar larvae apparently prefer larvae of small Diptera. They overwinter as third instar larvae and can survive total immersion, thereby withstanding winter flooding. Pupation takes place in the late spring without further feeding.
Map 21  *Osmylus fulvicephalus* (Scopoli 1763) – the giant lacewing
Osmylus fulvicephalus (Scopoli 1763) – the giant lacewing

Distribution and status

This species is widespread and frequently common throughout Wales and the Welsh borders and in southern England, south of a line from London to Bristol. There are also records from Yorkshire, East Anglia and southern Ireland, with a single recent Scottish record from Mid Perthshire. There is an earlier Scottish record (Fraser 1959) which is supported by a specimen in the McLachlan collection at the Natural History Museum, London. It is labelled 'Rannoch, 1857', which is also in Perthshire. There are no Channel Islands records. This large insect may be far more widespread than suggested by the map. Though easily seen when in flight, it may be overlooked in areas where it is thought not to occur.

Habitat

All but two records received relate to the edge of streams, rivers or, rarely, non-flowing water bodies. The other two records relate to woodlands where there are suitable streams close by. Woodland habitats feature prominently on the record cards, with over 90% of records relating to streams or rivers passing through deciduous woodland.

Collecting

The species appears to be crepuscular; during evenings in May and June, adults fly low over the water surface, where they can be seen and netted easily. During the daytime they can be found under bridges or overhanging trees in shaded situations, usually resting under horizontal surfaces. They are rarely found under those parts of bridges which are only in shade for part of the day. There is also an old record of an adult at a lepidopterist's sugar-patch (Fassnidge 1931). Larvae can be found in damp moss at the water’s edge, especially in August and September.

Season

The main adult flight period extends from the end of May to early August, with scattered records in April and September.
The Sisyridae (spongeflies) are small brown lacewings represented by one genus (Sisyra) in Britain and Ireland. All three species have unpatterned wings and can easily be confused with Sympherobius species, which are superficially similar. The adults appear to be strictly nocturnal. There is no adequate key to the larvae, which are fully aquatic and parasitise freshwater sponges of the family Spongillidae.

The life cycle of *S. fuscata* is summarised by Elliott (1977). Eggs are laid on trees or other objects overhanging water and, on hatching, the larvae fall into the water and drift until they come into contact with a sponge. By this means, they have the capacity to disperse downstream over long distances. *S. fuscata* has been recorded on and inside *Spongilla lacustris* and *Ephydatia fluviatilis*. The final instar larvae leave the sponge and swim to the shore from where they seek out suitable crevices on a tree or a wall and overwinter in the prepupal state.

Little is known about the life cycle of *S. dalii* and *S. terminalis* and, because they are far less frequently encountered than *S. fuscata*, it is possible that there are significant differences in their habitat requirements. *S. terminalis* seems to prefer water overhung by oaks, so there may be some association with that tree, either as an oviposition site, an overwintering site or as a source of food for the adults.

Collecting adults is difficult because they are nocturnal and live in the canopy of trees. Although all three species will come to light, aerial malaise traps and insecticidal fogging could also be used in collecting.

**Identification** (see Figure 3)

*Sisyra* spp. are recognised by the subcostal vein which bends to meet vein R1 before the wing tip. In the superficially similar genus *Sympherobius*, the subcosta continues to the wing tip where it meets the costal vein. Identification to species level requires examination of the genitalia (see Elliott 1977).

![Figure 3.1](image) Left fore-wing of *Sisyra* spp.

![Figure 3.2](image) Left fore-wing of *Sympherobius* spp.

- A: Subcosta fuses with vein R1 before wing tip
- B: No recurrent humeral vein
- C: Vein R1 reaches wing tip
- D: Subcostal vein also reaches wing tip
- E: Recurrent humeral vein
Map 22  *Sisyra fuscata* (Fabricius 1793)
Sisyra fuscata (Fabricius 1793)

Distribution and status

This is apparently the commonest and most widespread species of the genus. The map shows frequent records from England and Wales, although there is an area in south-west England and south-west Wales where it is apparently absent. The few Scottish and Irish records suggest that it may prove to be more widespread there. The scarcity of recent records in East Anglia may be due to under-recording. It has apparently not been recorded from the Channel Islands.

Habitat

The comment in Fraser (1959), that S. fuscata frequents similar situations to S. dalii, is not supported by data from the Recording Scheme. They indicate that slow or non-flowing water bodies are preferred by S. fuscata. Records are available from, or in association with, canals, slow rivers, garden and village ponds and flooded dune slacks, but there are some records associated with streams and fast-flowing rivers.

Collecting

Like all species in the genus, adults frequent the tops of trees near water and so are difficult to find. They can be taken by sweeping and beating foliage, but most records obtained in this way are of teneral specimens. Newly emerged adults can occasionally be found under bridges or tree branches over water. This species is frequently taken in mercury vapour light traps, though less frequently in Rothamsted light traps which use tungsten filament bulbs. It has been taken regularly in malaise traps at wetland sites.

Season

The adult flight period is mainly in June, July and August, with some records in May and a few through to October.
**Sisyra dalii** McLachlan 1866

**Distribution and status**

This species is usually local and scarce, but is sometimes abundant where it occurs. Most records are from Wales and Shropshire, the Lake District and extreme southern England, from Lands End to London. There is also an old record from Yorkshire and a single Irish record from Inverin, West Galway. It has not been recorded from Scotland or the Channel Islands. It is almost certainly under-recorded, but is probably a species of restricted distribution.

**Habitat**

The majority of records are from rock-strewn, fast-flowing rivers in upland areas. Most of these rivers are acidic, but there are also records from calcareous rivers such as the River Mole in Surrey. There are also confirmed records from a few still water sites such as the Shropshire Union Canal at Llangollen and Cole Mere, near Ellesmere. No information on host sponges is available.

**Collecting**

It can be taken by sweeping riverside vegetation and beating riverside trees and bushes, and it has also been taken at light.

**Season**

The adult flight period extends from week 23 to week 34.
Map 24  *Sisyra terminalis* Curtis 1854
**Sisyra terminalis Curtis 1854**

**Distribution and status**

This is our rarest *Sisyra* species (or it may be the most difficult to find in the field). The few records received by the Scheme are widely scattered: in the west Midlands and south-east England, with outlying localities at Bangor and Symonds Yat, and in Killarney, Lucan and Fota in southern Ireland.

**Habitat**

Habitat was not recorded on any of the cards received for this species.

**Collecting**

Most of the records which include details of the capture method were from light traps, both mercury vapour and tungsten filament types. Specimens were netted on one occasion, when several hundred adults were seen swarming around bushes overhanging the River Thames near the centre of Staines, Middlesex.

**Season**

The adult flight period extends from week 23 to week 34.
Two species of antlion have a slight claim to 'British' status. One occurs on Jersey, but is apparently absent from both Britain and Ireland, and the other was recorded as a single specimen in Suffolk, in 1931, and has not been recorded since.

In the subfamily Myrmeleontinae, which includes both these species, the predatory larvae are subterranean, living individually in a vertical tunnel constructed in sand. A cone-shaped pit surrounds the entrance hole and the larva feeds on ants and probably other invertebrates which fall into this insect-equivalent of the entomologist's pitfall trap. Members of other subfamilies have differing methods of capturing ants; some live on tree trunks and others in dry rot-holes in trees.

Stable sand dunes are the principal habitat of antlions. It is possible, but unlikely, that one of the many species of antlion present in Europe may occur, as yet undetected, in suitable areas along the British, or even the Irish, coastline. The adults can look deceptively like teneral damselflies and could therefore be overlooked.

**Identification**

Keys to the European species, which include the two 'British' species, are published in French (Séméria & Berland 1988) and in German (Aspöck *et al.* 1980). A revision of the classification of the Myrmeleontidae, based on larval characters, is given by Stange and Miller (1990).
Map 25  *Euroleon nostras* (Fourcroy 1785)

*Myrmeleon formicarius* Linnaeus 1767

- ■ *Euroleon nostras* 1980–92
- ● *Euroleon nostras* 1900–79
- • *Myrmeleon formicarius* 1900–79
**Euroleon nostras (Fourcroy 1785)**

**Distribution and status**

It occurs at several localities on Jersey, but is not yet recorded from Guernsey.

**Season**

The adult flight period is in mid-September.

**Myrmeleon formicarius Linnaeus 1767**

**Distribution and status**

There is a single record of a male of this species taken from a paling at Gorleston, on the East Suffolk coast, on 5 September 1931 (Doughty 1931; Killington 1932). The captor, C G Doughty, assumed it to be an uncommon species of dragonfly which lacked bright colours, and passed it to Claude Morley, who was responsible for the original identification. This identification was confirmed by Killington.

Stephens (1829) includes this species, but only as doubtfully indigenous. There is an even earlier reference to this as a British species, in Barbut (1781), though without details. Hagen (1858) states that it was 'almost certain that at least two species of Myrmeleon will be found in Britain, probably more,...' but provided no evidence. McLachlan (1868) considered that 'we have no native member of the handsome Myrmeleonidae' in Britain.

The Gorleston site stood 'upon glacial sand, not dissimilar from that of Fontainebleau Forest where *M. formicarius* abounds' and Morley adds, in an editor's footnote to Doughty (1931), that the area has been practically unworked for over a hundred years. In view of this evidence, it is just possible that there was a small, resident population of this ant-lion on the Suffolk coast which is now extinct. Killington (1932) considered that 'While the species can not be placed on the British list on the strength of this capture, it is quite possible that it will yet be found to breed here and entomologists living in sandy districts should keep an eye open for the pits made by the larvae'. Since that time, many of the sandy heaths of the area have been afforested, turned to arable land or grassed over as airfields, but many of the remaining areas have been the subject of entomological surveys.
This large, and economically important, family of lacewings is represented in Britain by the seven genera: *Psectra*, *Micromus*, *Hemerobius*, *Wesmaelius*, *Sympherobius*, *Megalomus* and *Drepanepteryx*. The most recent check list of British species (Barnard 1978) includes 29 species in these genera, but, since then, *Hemerobius fenestratus* has been added (Plant & Barnard 1988), bringing the total to 30 species. Only 15 species have been recorded from Ireland (Barnard et al. 1991).

**Identification**

The standard work (Fraser 1959) contains several errors and some parts of its keys are unworkable. The recommended guides to identification are summarised in Table 1 and, for a wider perspective, the keys in Aspöck et al. (1980) are excellent. The male genitalia provide important diagnostic features: the figures in Killington (1936, 1937) can be used as a preliminary guide, but there are better figures in Aspöck et al. (1980). The genitalia of *Hemerobius fenestratus* are also figured by Plant (1989). There appear to be no satisfactory keys to species for the larvae of British/Irish Hemerobiidae, but there is a useful key to genera and some subgenera of European species in

Map 26  *Psectra diptera* (Burmeister 1839)
Psectra diptera (Burmeister 1839)

Distribution and status

Killington (1936) listed only one Irish and four British records of this species and considered it to be rare. Fraser (1959) stated that it was 'widely distributed throughout the British Isles but most common in Scotland'. However, there are few published records or museum specimens from Scotland and the Scheme has only five Scottish records, all from before 1954. Records show it to be widespread but patchy in both Britain and Ireland, suggesting that the species is under-recorded. Recent work, in Wales and the East Anglian fens, indicates that appropriate collecting methods are very important in finding this species. It may indeed prove to be widespread in much of Britain and Ireland.

P. diptera exists in two forms, occurring in either sex, sometimes with both forms in the same population. In the so-called micropterous form, the hind wings are vestigial and the insect is probably incapable of flight. The macropterous form has all four wings fully developed and is certainly capable of flight. The macropterous form is more frequently reported at the end of hot, dry summers and affects second-generation adults, possibly being a dispersive phase.

Habitat

It is recorded from acid bogs in Wales, fens in East Anglia, and from acidic, neutral and alkaline unimproved grasslands, calcareous semi-improved grasslands, and sand dunes. It has also been recorded from rank vegetation at woodland edges, from roadside verges, disused railway lines and a range of similar habitats. Where it occurs there is a common habitat feature: tussocky, occasionally dense, grassy vegetation. It seems that the occurrence of Psectra diptera is linked to the microhabitat provided by grass tussocks, rather than to the habitat in which the tussocks occur (Kirby & Welch 1990).

Collecting

Pitfall traps and water traps have been used effectively to catch P. diptera. A small number of records of macropterous specimens, of both sexes, have been from light traps. Hand searching the roots of grasses and other vegetation, using a pooter, has also been productive. A few examples, all micropterous females, have been taken by sweeping vegetation.

Season

The adult period is between June and September.
Map 27  Micromus variegatus (Fabricius 1793)
**Micromus variegatus (Fabricius 1793)**

**Distribution and status**

This species is widespread and common in England and Wales, becoming more rare and localised north to Scotland, but in Ireland it may be widespread. It also occurs in the Channel Islands.

**Habitat**

A eurytopic species, it is found in all the habitats listed for *M. paganus*. Newly emerged adults, still unable to fly, have been reported from gardens where there are no trees, suggesting that it is associated with herbaceous plants or grasses.

**Collecting**

It is regularly taken in pitfall traps, but is less often caught with light traps or in malaise traps. It has also been found when hand searching ground level vegetation for *Psectra diptera* and occasionally by sweep netting but only rarely by beating trees and bushes.

**Season**

There are two peaks in the adult flight period suggesting that there may be two generations. The earlier peak is small, running from mid-May to mid-June (weeks 20–25). The second peak runs from the end of July through to early September (weeks 30–36). There is also a scatter of early and late records from mid-April and mid-October.
Map 28  *Micromus angulatus* (Stephens 1836)
**Micromus angulatus** (Stephens 1836)

**Distribution and status**

Although it is widespread and generally uncommon, it is occasionally found to be common in localised areas. In England it has been recorded from as far north as Wharram Quarry LNR in South-east Yorkshire, but is not known from Scotland. It is also present in Wales and Ireland, but is clearly under-recorded.

**Habitat**

No clear habitat preference has yet emerged from data submitted to the Scheme. Records have been from unimproved chalk grassland, a limestone quarry, damp verges on arable land, suburban gardens, scrub and woodland. At many sites the soil is calcareous. Low herbage seems to be the only constant feature, and it may be that the requirements of *M. angulatus* are similar to those of *M. paganus*.

**Collecting**

During May 1990 several examples were taken in malaise traps at Silwood Park, Berkshire, as a result of which there are more records of individuals from this one locality than there are for the rest of Britain and Ireland. Clearly, malaise trapping is an effective collecting method. There are a few records from light traps, but most other records are from sweeping low-growing vegetation in a variety of habitats.

**Season**

The adult flight period extends from week 15 to week 42, with the majority of records in the period weeks 26–34.
Map 29  Micromus paganus (Linnaeus 1767)
**Micromus paganus (Linnaeus 1767)**

**Distribution and status**

This species is widespread and quite common throughout the whole of Britain and Ireland, from the extreme north of mainland Scotland to near Land’s End, and also from the Channel Islands. It is under-recorded in Ireland.

**Habitat**

It is ubiquitous, occurring in woodland, scrubland, heathland, unimproved and semi-improved grassland (neutral, acidic and calcareous types), gardens, town parks and even in wasteland. Adults seems to be associated with low-growing herbage of a variety of types.

**Collecting**

It is taken regularly in light traps and malaise traps and is often the most common lacewing in light traps in Scotland. It has also been recorded by sweeping and beating vegetation. Unlike most lacewings, it is also frequent in pitfall traps, which suggests that it is not an arboreal species.

**Season**

Records are spread over a long season, from week 12 to week 37, with an isolated record in week 48. There is a distinct peak in June and a slight one in August.
Map 30  *Hemerobius humulinus* Linnaeus 1761
**Hemerobius humulinus Linnaeus 1761**

**Distribution and status**

*H. humulinus* is widely distributed and very common throughout much of Britain, Ireland and the Channel Islands, but it is more scarce in Scotland.

**Habitat**

It is a eurytopic species, having been recorded from woodlands, hedgerows, scrub, parks, gardens and most habitats where there are trees or bushes.

**Collecting**

It is easily recorded by beating and sweeping vegetation, and it has also been recorded in malaise traps, suction traps and light traps. It has not yet been taken in pitfall traps.

**Season**

Adults have been recorded from April to October, but the long season and two peaks (centred on May and June to August) suggest that there may be more than one generation per year.
Hemerobius perelegans Stephens 1836

Distribution and status

This species is very local and rare. Stephens believed that the origin of his type specimen was the New Forest, but both Killington (1937) and Fraser (1959) expressed doubts that this was the true locality. Unfortunately, neither author gave reasons for their doubt, and it can only be assumed that doubt was inferred because the few other British records known at that time were all from Scotland. This doubt may well be unjustified; the current known distribution includes records from South Northumberland and South-west Yorkshire. However, in the interests of accuracy, the New Forest record is excluded from the distribution map.

Habitat

It is apparently confined to birch.

Collecting

All the specimens for which capture data are available were beaten from birch.

Season

There are records of adults in weeks 20, 22, 24 and 25.
**Hemerobius simulans** Walker 1853

**Distribution and status**

This species is widespread and locally common throughout Britain and Ireland, but has not yet been recorded from the Channel Islands, the Hebrides, Orkney or Shetland. It is possibly under-recorded because it appears later in the year than other species. Records early in the season, by J J F X King and by G T Porritt, have been omitted as they possibly refer to *H. lutescens* (Killington 1937); however, King’s collection at the National Museum of Ireland has not yet been re-examined.

**Habitat**

It is apparently confined to larch, but it may also occur on spruce (*Picea* spp.) and pine.

**Collecting**

Almost all the Scheme’s records were from light trap captures. Beating the lower branches of larches, in late August or early September, has also produced specimens.

**Season**

There are some winter records (weeks 4, 13, 17, 19 and 46), but this is mainly a late summer/autumn species, with a peak of records in July to September.
Map 33  Hemerobius stigma Stephens 1836
Hemerobius stigma Stephens 1836

Distribution and status

This species is widespread and very common throughout Britain, but less so in Ireland. It has also been recorded from the Channel Islands, but not from the Hebrides, Orkney or Shetland.

Habitat

It is confined to pine, especially Scots pine.

Collecting

Most records are from light traps, with a few from malaise traps and from beating pine foliage.

Season

It has a long season, suggesting that there may be more than one generation per year. There are isolated winter records in weeks 4, 44 and 46. Although there are records from March through to October, there are two distinct peaks of records in April and July.
Map 34  *Hemerobius atrifrons* McLachlan 1868
Hemerobius atrifrons McLachlan 1868

Distribution and status

This species is widespread but local throughout Britain, but has not yet been recorded from Ireland or the Channel Islands.

Habitat

It is apparently confined to larch. Records from other species of conifer have not been confirmed.

Collecting

It is easily beaten from branches of larches, especially those along the edges of rides in plantations.

Season

Although there are records from mid-April to early October, the majority are from May and June.
Map 35  *Hemerobius pini* Stephens 1836
**Hemerobius pini Stephens 1836**

**Distribution and status**

It is widespread and locally common wherever there are pine trees, but it is probably under-recorded in most areas. The only Irish record was in 1975, when a single specimen was collected in Co Wicklow (Speight 1979). This species may eventually prove to be common in the appropriate habitat.

**Habitat**

It appears to be confined to pines, especially Scots pine, and large numbers may be present on even isolated and solitary trees. It has been taken in association with other species of pine in plantations.

**Collecting**

This species is strictly arboreal and is most often recorded at light, but it can sometimes be beaten from pine branches.

**Season**

There is a long season from week 14 to week 35, suggesting that there may be more than one generation per year.
**Hemerobius contumax Tjeder 1932**

**Distribution and status**

There are very few records of this species, most of which require confirmation. Much confusion has resulted from nomenclatural difficulties: the species referred to here as *H. contumax* was called *H. limbatellus* by McLachlan, Lucas and Killington, but the epithet *limbatellus* Zetterstedt has also been applied to *H. stigma* (which is common) and to *H. fenestratus* (which is rare). All published records require confirmation before acceptance for the Recording Scheme. Killington (1937) lists three records of *H. limbatellus*:

- Leith Hill, Surrey, 6 June 1869 (P C Wormald)
- Black Park, Buckinghamshire, 25 June 1873 (R McLachlan)
- Buttercrambe Woods, Yorkshire, no date (J M Brown)

Only the first has been confirmed as *H. contumax* (Killington 1934) and there is a second specimen (a male), collected from the same locality July 1952, in the collection of the Natural History Museum, London. There is sufficient evidence to accept the Black Park record as *H. contumax*, but the Yorkshire specimen has not been located.

Since 1937, there are only two records in addition to the Leith Hill specimen: from Farley Down, South Hampshire, in 1938, and from Bignor, West Sussex, in 1945.

**Habitat**

It is reportedly confined to conifers.

**Collecting**

No data are available.

**Season**

The records date from weeks 14, 16, 26 and 29.

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**Hemerobius fenestratus Tjeder 1932**

**Distribution and status**

It is known in Britain from a single record, of a male netted in flight on 9 September 1986 at Etchden Wood, East Kent (Plant & Barnard 1988). It is probably confined to pines and may be a locally distributed species in Kent and elsewhere.
Map 37  *Hemerobius nitidulus* Fabricius 1777
**Hemerobius nitidulus Fabricius 1777**

**Distribution and status**

This species is widespread in Britain and is locally quite common in most of England, becoming scarcer in Wales and Scotland. It is known from two areas in Ireland. It is not known to occur on the Channel Islands.

**Habitat**

It is apparently confined to pines, and there are records from several habitats, including heathland and domestic gardens where pines are present.

**Collecting**

Most records are from light traps. It has also been recorded from malaise traps and can be taken by beating the lower branches of pine trees in mixed coniferous/deciduous woodland during June.

**Season**

The season extends from April to October, with several peaks, suggesting that there is more than one generation per year. Highest numbers have been recorded in May/June (weeks 21–26), July/August (weeks 29–32) and September (weeks 35–38).
**Hemerobius micans Olivier 1792**

**Distribution and status**

It is widespread and very common throughout Britain and Ireland, including the Scillies and the Channel Islands, but it has not been recorded from the Hebrides, Orkney or Shetland. It is frequently the most commonly recorded lacewing in woodland.

**Habitat**

It is probably obligatorily associated with oak trees. Most records relate to woodland, but it is also frequently recorded in town parks, gardens and other habitats when there are mature oak trees nearby.

**Collecting**

Beating the foliage of oak trees, between May and August, is a reliable method of collection. It has also been taken at light, in malaise traps and in suction traps. Sweeping hedgerows and general herbage in the vicinity of oak trees has also produced specimens.

**Season**

The season extends from April to October, with an outlying record in December. There is a marked peak of records in week 20, part of a spring peak throughout May. Other distinct peaks of records are in July and in August.
Map 39  *Hemerobius lutescens* Fabricius 1793
**Hemerobius lutescens Fabricius 1793**

**Distribution and status**

This species is widespread and common throughout Britain and Ireland, including the Outer Hebrides and the Channel Islands, but it has not been recorded in Orkney or Shetland.

**Habitat**

It is eurytopic, occurring in the same habitats as *H. humulinus*. The two species are frequently taken together.

**Collecting**

It has been taken using most methods, except pitfall trapping.

**Season**

The season extends from April to October, with two slight peaks of abundance, in May/June and August/September.
**Hemerobius marginatus** Stephens 1836

**Distribution and status**

It is widespread in Britain and Ireland, and locally is quite common, but it has not yet been recorded from western Scotland, Orkney, Shetland, or the Channel Islands.

**Habitat**

It is most frequently associated with birch trees in woodland, but has also been taken from hazel (*Corylus avellana*) and alder in woodland.

**Collecting**

Beating the foliage of birch trees is the most frequently recorded method of capture. It also comes to light traps and has been taken in malaise traps in mixed woodlands.

**Season**

This species has a later season than many others in the genus, with most records being from June (week 24) to early October (week 41). There are two discernible peaks – in July and in August/September.
Map 41  *Wesmaelius malladai* (Navás 1925)
Wesmaelius malladai (Navás 1925)

In the past, there has been confusion between this species and W. mortoni. The W. malladai referred to here is the species called Boriomyia mortoni in Killington's monograph (1937), whilst Fraser (1959) refers to it as Kimminsia killingtoni. Fraser's key is not reliable for separating the two species, but an up-to-date key to Wesmaelius species is given by Barnard (1990b). For a fuller discussion of W. malladai and W. mortoni, see Kimmins (1963).

Distribution and status

The species is restricted to the Scottish Highlands where it appears to be somewhat local, but occasionally common, although it is under-recorded within this area.

Habitat

It has been recorded in association with birch and Scots pine in recent years and Killington (1937) also records spruce, larch and poplar (Populus spp.). A specimen from South Aberdeenshire, taken in 1982, was from an area of regenerating birch, aspen (Populus tremula) and juniper, and a specimen from Inverness, in 1967, was beaten from bilberry (Vaccinium myrtillus).

Collecting

It has been beaten from the foliage of all the above species and has also been taken in light traps and aerial suction traps.

Season

The adult flight period is in June and July.
Map 42  *Wesmaelius ravus* (Withycombe 1923)
**Wesmaelius ravus (Withycombe 1923)**

**Distribution and status**

This species is extremely local and rare. It was discovered new to science at Oxshott, Surrey, in 1922 and was taken there again in the following year (Withycombe 1923). There are only four other confirmed British localities:
- Brookwood, Surrey, 28 May 1934 and 5 June 1934, in a small pine wood near the village (Kimmins 1935);
- Keston Common, West Kent on 16 June 1936 and 10 and 11 May 1942 (F C Fraser's specimens in Hope Department, Oxford University Museum);
- Bournemouth, South Hampshire, 12 May 1940, 10 May 1942 and 11 May 1943 (Fraser 1940, 1944), and a female in a malaise trap between 26 August and 2 September 1991 (R S George);
- Bangor, Caernarvonshire, one specimen in a Rothamsted light trap in the town on 7 May 1980 (M J Morgan).

Three records remain unconfirmed and are not mapped. They are from Bedfordshire: Luton in 1946, and Ravensdell Wood and Sandy in 1973.

**Habitat**

It appears to be confined to Scots pine.

**Collecting**

It has been taken in a light trap (tungsten filament bulb) and in a malaise trap. There is no indication of how the earlier specimens were collected, but adults have been found on Scots pine trunks in the early morning.

**Season**

There are confirmed records from May, June and August/September.
Map 43  Wesmaelius balticus (Tjeder 1931)
Wesmaelius balticus (Tjeder 1931)

Distribution and status

This is a coastal species, having been recorded from 11 sites, from the Severn estuary north to Elgin. The two inland records, in central Wales, were taken at light traps during the exceptionally hot summer of 1976. A review of the British records and current status of this species is given in Plant (1991b).

W. balticus looks deceptively like Hemerobius micans and is easily passed over for this more common species. All examples of H. micans, taken on or near sand dunes, should be checked using the keys in Barnard (1990a).

Habitat

It is confined to stable sand dunes with marram (Ammophila arenaria). The larvae are believed to be associated with marram.

Collecting

It can be swept from marram, but when disturbed the adult folds its wings and drops to the ground. Most records are from light traps.

Season

There are records from weeks 24, 25, 29, 30 and 31.

Wesmaelius mortoni (McLachlan 1899)

(Not mapped)

Distribution and status

This species is considered to be extinct in Britain. It is known from only three specimens, from the following localities:

1 male (lectotype) & 1 female (allotype), Rannoch, Mid Perthshire, 11–14 June, 1898. K J Morton;
1 female, Balerno, Midlothian, no date.

Both of the Rannoch specimens are in the K J Morton collection at the Royal Museum of Scotland. The collector of the Balerno specimen is not clear, but it was probably not Morton.
Map 44  *Wesmaelius betulinus* Strøm 1788
**Wesmaelius betulinus Strøm 1788**

Most European workers (eg Monserrat 1990) regard the epithet *betulinus* as a *nomen dubium*, and consider *nervosus* to be the correct name for this species. The type specimens are apparently missing, but Strøm's illustrations leave no doubt that he was describing this species and therefore the name *betulinus* has priority.

**Distribution and status**

This species is widespread and very common throughout Britain and Ireland, but has not yet been recorded from the Channel Islands, Orkney or Shetland. Because of the need to examine the genitalia (of both sexes) to separate this species from the equally common *W. subnebulosus*, all records of unsexed specimens are omitted from the map. The unicolorous, grey form *melancholica* Killington 1937 occurs as frequently as the typical form, with most populations containing both forms.

**Habitat**

It is eurytopic, having been recorded in almost every habitat, from gardens and parks to woodland, wherever there are trees or bushes. Larvae have been collected from a wide variety of deciduous trees and from stinging nettle (*Urtica dioica*) (Killington 1937). Despite its name, there is no apparent restriction to birches.

**Collecting**

It has been taken by beating the foliage of trees and bushes and sweep netting vegetation. It is readily attracted to light and has been taken regularly in malaise traps. It has twice been taken in pitfall traps, and occasionally from water traps at ground level.

**Season**

It has a long season, from March to October, with several apparent peaks which suggest that there are at least two generations, in spring and autumn, and with a possible third mid-summer generation.
Map 45  *Wesmaelius subnebulosus* (Stephens 1836)
**Wesmaelius subnebulosus** (Stephens 1836)

**Distribution and status**

This species is widespread and extremely common, even locally abundant, throughout most of Britain, from Shetland to the Channel Islands. However, it is only sparsely recorded from Ireland and has not been recorded from the Outer Hebrides. The form *melancholica* Killington 1937 is unmarked and grey, and in all aspects (except genitalia) is identical to f. *melancholica* of *W. betulinus*. This form and the typical *subnebulosus* occur with equal frequency, with both present at most localities.

**Habitat**

It is ubiquitous, having been recorded in all the habitats listed on the recording card, except for 'saltmarsh' and 'submerged aquatic'.

**Collecting**

It has been recorded frequently at light, is common in malaise traps and has occasionally been taken in both pitfall traps and water traps. It is easily obtained by beating trees, and sometimes by beating bushes, especially hedgerows, and by sweeping rough vegetation.

**Season**

This species has a long season occurring from late March to early November, but with a definite peak in July and August.
Map 46  *Wesmaelius concinnus* (Stephens 1836)
**Wesmaelius concinnus** *(Stephens 1836)*

**Distribution and status**

This species is apparently widespread in England and north Wales, but has, so far, not been recorded in central and southern Wales, the south-west peninsula, Ireland or the Channel Islands. There are only two Scottish records – Rannoch, 1903 and Glen Lyon, 1937, both in Mid Perthshire. It is usually recorded in only small numbers.

**Habitat**

It is associated with pine trees in woodland, although this need only be a single mature pine in a deciduous wood. In all cases where the species of tree has been recorded it was Scots pine.

**Collecting**

It has been recorded only by beating pine trees and in light traps.

**Season**

The season for this species appears short, with a concentration of records in June and July.
**Wesmaelius quadrifasciatus (Reuter 1894)**

**Distribution and status**

*W. quadrifasciatus* frequently occurs with *W. concinnus* and in many ways is similar, although less abundant. It has been recorded from Ireland only once, as a single specimen from Co Wicklow in 1975 (Speight 1976).

**Habitat**

It is apparently strictly associated with larch, but in woodland it can sometimes be taken from adjacent trees of other species.

**Collecting**

Beating the foliage of larch and nearby trees in woodland has produced almost all the records for which there are data on collecting method. There are also a few records of it in light traps.

**Season**

The season for this species appears short, with a concentration of records in June to August and a few records in May and in October.
Map 48  *Sympherobius elegans* (Stephens 1836)
**Sympherobius elegans** (Stephens 1836)

Hagen (1858) erroneously placed *S. pygmaeus* (as *Mucropalpus pygmaeus* Rambur) in synonymy with *S. elegans*. This mistake was perpetuated by McLachlan (1868) and persisted in the literature until at least 1931. Therefore, early published records of *S. elegans* must be treated with caution and, if the original specimens cannot be examined, records should be disregarded.

**Distribution and status**

It is widely distributed, and locally common, in eastern and central England, but absent from Scotland. Apart from three isolated records in Monmouthshire, it is absent from Wales and there are no recent records from western England. It is also absent from Ireland, although a specimen in the collection at the Natural History Museum, London, has a data label giving 'Killarney, 1862'. Peter Barnard (pers. comm.) has confirmed that this specimen, from the McLachlan collection, is mis-labelled. According to McLachlan's diary, the data should read 'British Isles, J C Dale and others'. It has not been recorded from the Channel Islands.

**Habitat**

This species is strictly associated with deciduous trees. Most records are from deciduous woodland, both high forest and coppice-with-standards. A few records are from domestic gardens and hedgerows. One record was made by sweep netting in neutral grassland. Killington (1937) notes a possible association with beech (*Fagus sylvatica*), but this is not confirmed by the recent data.

**Collecting**

Beating the branches of mature trees in woodland is the most frequently recorded collecting method. A few specimens were taken by sweeping and a few in light traps. There are no records from malaise traps.

**Season**

There are a couple of outlying records for weeks 9 and 38, but most are from June to August (weeks 23–35).
Map 49  *Sympherobius pygmaeus* (Rambur 1842)
**Sympherobius pygmaeus (Rambur 1842)**

**Distribution and status**

This species is widespread but local in England and Wales and is probably under-recorded. It has not been recorded from Scotland or Ireland, but is known from the Channel Islands.

**Habitat**

It is confined to mature oak trees, especially in high-forest woodland, but also on isolated trees such as in hedges, gardens and parks.

**Collecting**

Most records are from light traps, with a few from malaise traps and a very small number from beating the foliage of oaks.

**Season**

The adult flight period extends from early May to the end of September.
Map 50  Sympherobius pellucidus (Walker 1853)
Sympherobius pellucidus (Walker 1853)

Distribution and status

This species is widely distributed, but very local, in southern England and in Wales. It is absent from northern England, Scotland, Ireland and the Channel Islands.

Habitat

Few habitat data have been accumulated with the recent records, and such data are lacking from the labels of most museum specimens. It has been collected in deciduous woodland, mixed park woodland and beside a river. Large numbers were taken in Richmond Park, London, by fogging the canopy of oaks (Barnard et al. 1986). The suggestion that S. pellucidus is associated with conifers (Killington 1937) appears unlikely.

Collecting

Almost all records are from light traps or malaise traps. Killington (1937) took several by beating Scots pine and a female by beating ivy (Hedera helix) on an oak trunk.

Season

Most records are from late April to the end of June, with a peak in May, but there are a scatter of records in August and September.
Map 51  *Sympherobius fuscescens* (Wallengren 1863)
Sympherobius fuscescens (Wallengren 1863)

Distribution and status

This species is widespread but extremely local in England, Wales and Scotland. It is apparently absent from Ireland and has not been recorded from the Channel Islands. It is the only species of Sympherobius recorded in Scotland.

Habitat

It is strictly confined to Scots pine in Britain, although abroad it is associated with other species of pines.

Collecting

Most records have come from light trapping, with some also from beating the foliage of Scots pine.

Season

The adult flight period is from the end of May to mid-July, with outlying records in weeks 15 and 32.
Map 52  *Megalomus hirtus* (Linnaeus 1761)
**Megalomus hirtus** (Linnaeus 1761)

**Distribution and status**

It was formerly known from several sites in Kincardineshire, but is now apparently confined to the Edinburgh area where it is quite numerous and under no apparent immediate threat, though it is clearly vulnerable to changes in land management. The record from Devon (Parfitt 1879), although included in European distribution maps (Aspöck *et al.* 1980), cannot be substantiated and is almost certainly an error. The record from Co Durham (Wingate & Robson 1905) is also considered unreliable. Although it is under-recorded, it may be genuinely restricted to a small area of the north-east, perhaps confined by a need for a continental type of climate (Kirby 1991).

**Habitat**

In Scotland, it is associated with wood sage (*Teucrium scorodonia*), typically on rocky, exposed slopes, but on the continent it may not be confined to this plant, and so other plants may also be involved in Scotland. However, until recently, there has been confusion, on the continent, between *M. hirtus* and *M. tortricoides* Rambur, and it is unclear whether all the continental data for *M. hirtus* truly refer to that species.

**Collecting**

There are few data on collecting methods, but sweeping wood sage (and other plants) on rocky hillsides, the tops of sea cliffs and similar habitats, between mid-July and mid-August, may be rewarding. *M. hirtus* is inconspicuous and is very easily overlooked.

**Season**

There are records from weeks 25, 26 and 35.
Map 53  *Drepanepteryx phalaenoides* (Linnaeus 1758)
**Drepanepteryx phalaenoides** (Linnaeus 1758)

**Distribution and status**

The map shows two distinct groups of records – in south-east England and in the north of England. Collins (1990) suggests that it established only recently in the south-east, possibly as a result of immigration. This suggestion is supported by the fact that the only old record from the south-east (Bexhill, East Sussex, 1914) was made on a coastline known for insect immigration. There are recent records from Wales (Ty Coed, Cardiganshire, 1990) and Ireland (Newbridge Fen, Kildare, 1989) as well as several old ones from Scotland (Pitlochry, East Perthshire, 1892 (mapped) and Dumfriesshire, Lanarkshire and Midlothian (not mapped)). All this evidence suggests that under-recording may be responsible for the apparently disjunct distribution.

**Habitat**

There is a clear association with dense deciduous woodland containing mature oak trees, but there is a single record from semi-improved chalk grassland at Colekitchen Down, Surrey. Killington (1937) gives the habitat as 'dense undergrowth of hedges, from bushes and trees in woods and in more open spaces' and it is probable that dense undergrowth is an important resting site for adult insects.

**Collecting**

The majority of the records are from light-traps in woodland. There are also records from beating oak, beech and holly, and Leech (1962) beat an adult from hawthorn (*Crataegus* spp.). The sole Irish record was from a suction trap. Adults are very well camouflaged; specimens resemble bits of dead leaf and are easily overlooked. Larvae have been found on apple (*Malus* spp.), plum (*Prunus domestica*), beech, elm and oak trees (Killington 1937).

**Season**

Several authors (eg Killington 1937; Collins 1990) have suggested that *D. phalaenoides* may hibernate as an adult. There is no proof from the present data, but, from the few that are available, the abrupt end of the flight period in October and the early emergence of some individuals in the spring may support this idea.
Worldwide, the Chrysopidae (green lacewings) are one of the largest families of the Neuroptera, and one of the most important economically. Over 1200 species, in 86 genera and sub-genera, are now recognised (Brooks & Barnard 1990). There has been confusion in the classification of the species, due in no small part to lack of clarity in the original descriptions of many species.

Killington (1937) retained the genus *Chrysopa* for all the British and Irish species, except for two species which he placed in *Nathanica*. He found it impossible to divide this very large genus in a satisfactory manner. The revision of the Chrysopidae on a worldwide basis (Brooks & Barnard 1990), although long overdue, means that some hitherto unfamiliar names have come into use. The family Chrysopidae of Britain and Ireland is now regarded as comprising seven genera: *Chrysopa*, *Chrysoperla*, *Chrysopidia*, *Cunctochrysa*, *Mallada*, *Nineta* and *Nothochrysa*.

At the time of writing, 16 species of chrysopid are recognised from Britain and Ireland. However, recent papers by Leraut (1991, 1992) suggest that *Chrysoperla carnea*, our commonest species, actually comprises four species: *C. renoni* (Lacroix), *C. kolthoffi* Leraut and *C. carnea* (Stephens). All four taxa may occur in Britain, but it has not been possible, at this late stage, to segregate records. In this Atlas, therefore, records of *C. carnea* are of the aggregate species only.

**Identification**

Fraser (1959) contains a few errors and omits some species. The current texts for identification are Barnard (1990c) and the subsequent note by Plant (1991d).
Map 54  *Chrysopa abbreviata* Curtis 1834
Chrysopa abbreviata Curtis 1834

In the key to species of Chrysopa by Fraser (1959), the tarsal claw characters are reversed in the couplet which separates C. abbreviata from 'C. phyllochroma'. Thus, it is C. abbreviata which has the tarsal claws dilated at the base, not C. phyllochroma. Killington (1937) has this couplet the correct way round.

Distribution and status

The species is very locally distributed around the western and southern coasts of England and Wales, from Ravenglass, Cumberland, in the north-west, to Great Yarmouth, East Norfolk, in the east. It has been recorded in Ireland twice, from Co Wicklow in 1926 (O'Connor 1983) and Co Dublin (Barnard et al. 1991). It is still present at Braunton Burrows, North Devon, at Ainsdale, South Lancashire and at several localities in North Wales, and it is often quite common in these places. However, it has not been reported at its Pembrokeshire locality since 1939, and it has not been seen on the Gower peninsula, Glamorganshire, since 1952. The last report from Dorset was in 1922 and it has not been noted in East Kent or East Norfolk since 1937. It is difficult to understand why it no longer appears to occur at any of these localities.

Habitat

It is a nocturnal insect occurring on stable sand dunes, where it is associated with marram.

Collecting

Records have come from sweep netting marram and from light traps.

Season

The adult flight period is from late April to early September, possibly with a peak in June and July.
**Chrysopa phyllochroma Wesmael 1841**

Kis and Ujhelyi (1965) demonstrated that the species to which both Killington (1937) and Fraser (1959) had referred as *C. phyllochroma* comprised two species – *C. phyllochroma sensu stricto* and a new species, *C. commata*. It is not possible to say to which species either Killington and Fraser actually referred.

**Distribution and status**

It appears to be very local and rare in England and Wales and has not been recorded from Scotland or Ireland. Because of earlier confusion of this species with *C. commata*, old records have been omitted, except where it has been possible to re-examine voucher material.

**Habitat**

There is no information available.

**Collecting**

The only recorded method of capture is in light traps.

**Season**

Only six records give detailed dates; these are in weeks 24, 25, 26 and 29.
**Chrysopa commata** Kis & Ujhelyi 1965

**Distribution and status**

It is widespread but local in eastern England and the Midlands, north to Lancashire and Lincolnshire, with a single old record from Devon. It has not been recorded from Wales, Scotland or Ireland. It is apparently more widespread and more common than *C. phyllochroma*.

**Habitat**

Specimens have been swept from rank grassland beside the River Thames in Essex, but there are no other data available.

**Collecting**

Apart from the record by sweeping, most records are from tungsten filament light traps.

**Season**

The adult flight period appears to run from early June to the end of August, with a peak in July. There is one record in early May.
Map 57  *Chrysopa dorsalis* Burmeister 1839
Chrysopa dorsalis Burmeister 1839

Distribution and status

This species is extremely local and usually rare, but is numerically common at one or two sites. It is undoubtedly a rare insect in Britain, but may be more widespread than the map indicates.

Habitat

It is restricted to pine trees, especially Scots pine, but it has been recorded from other species which were not specified. It is not recorded from isolated trees and seems to be associated with large pine plantations.

Collecting

Adults can be beaten from pine branches. In the Wyre Forest NNR, the single record was made in a malaise trap. Abroad, it is regularly taken in mercury vapour light traps.

Season

The present records suggest an adult flight period from May to August.
Map 58  *Chrysopa perla* (Linnaeus 1758)
**Chrysopa perla (Linnaeus 1758)**

**Distribution and status**

This species is widespread and very common in England, Wales and southern Scotland. It seems to be absent from central and northern Scotland. King and Halbert (1910) regarded this species as 'doubtfully Irish' and since that time there have been no Irish records. It has been recorded from the Channel Islands.

**Habitat**

It is known from a variety of habitats, especially scrub, hedgerows and other areas of rank herbage with bushes. Most woodland records are from woodland edge habitats rather than the interior of the woods. There are very few records from gardens and it is more common in rural areas than in urban ones.

**Collecting**

It can be taken by sweeping and beating vegetation. Only a few records are from malaise traps, and even fewer from pitfall traps. It is not common in light traps, but sometimes comes to house lights at night.

**Season**

The records show a distinct single peak, from mid-May to mid-July, but a long season extending from late April (week 17) to late September (week 38).
Map 59  Chrysopa pallens (Rambur 1838)
(= septempunctata Wesmael)
Chrysopa pallens (Rambur 1838)

Distribution and status

This species is widespread and fairly common in England and Wales, becoming rarer towards the north Midlands and with only a few records north of a line from the Dee to the Humber. It is apparently absent from Scotland and Ireland, but has been recorded in the Channel Islands.

Habitat

Many records are from domestic gardens and town parks where there are bushes and shrubs. There are also records from unimproved grassland, both neutral and calcareous, and a few from woodland, especially the edges of woods.

Collecting

Most records have come from light traps, with a few from malaise traps, but only a small number from general sweeping and beating.

Season

The adult flight period runs from late May to early October, with most records in June and July.
Map 60  *Chrysoperla carnea* (Stephens 1836)
**Chrysoperla carnea (Stephens 1836)**

**Distribution and status**

It is widespread and abundant throughout Britain and Ireland, from Shetland to the Channel Islands and including the Outer Hebrides. Within this range, it is markedly less frequent in areas where there are no trees.

Leraut (1991, 1992) split *C. carnea* into four taxa. It is possible that these taxa exist in Britain and Ireland. *C. carnea sensu stricto* certainly occurs, and an examination of specimens in the Passmore Edwards Museum and the author’s collection indicates that most specimens are this taxon. Re-examination of collections of *C. carnea sensu lato* remains to be undertaken, so that the following map and text refer only to the aggregate taxon.

**Habitat**

It occurs almost everywhere, but the presence of trees, hedges or even isolated bushes is probably essential. Larvae have been recorded from almost every native species of deciduous tree and shrub, and they have also been swept in grasslands, wetlands, sand dunes and other habitats. *C. carnea* is often the only green lacewing reported in some urban areas.

**Collecting**

This is the only green lacewing which hibernates as an adult, often entering buildings to do so. Examples collected in the field have been taken by sweep netting, beating trees and bushes, light traps, water traps, malaise traps and pitfall traps.

**Season**

There are records from almost every week in the year, but in the winter months these include records of overwintering adults from inside buildings. There are probably several generations, with peaks of records in May, July and August/September.
Map 61  **Chrysopidia ciliata** (Wesmael 1841)
**Chrysopidia ciliata (Wesmael 1841)**

**Distribution and status**

This species is widespread and locally quite common in England and Wales, but rather more local in Scotland and perhaps genuinely absent from much of the Highlands. It is widespread but rather local in Ireland, but some records could not be localised beyond the county level. It is also present in the Channel Islands.

**Habitat**

The records indicate a general agreement with Killington (1937) that *C. ciliata* is associated with deciduous woods and hedges. It is also found in suburban gardens, but it is apparently absent from truly urban areas.

**Collecting**

It is regularly recorded at light traps and often attracted to house lights at night. It is easily beaten from the lower branches of deciduous trees, showing a slight preference for oak, and from hedges in rural areas.

**Season**

Most records are from June and July, but there is a scatter of records in late May and in August and September. There are also isolated records in weeks 16 and 40.
Map 62  Cunctochrysa albolineata (Killington 1935)
Cunctochrysa albolineata (Killington 1935)

Distribution and status

It is widespread and quite common in England and Wales, but local and scarce in Scotland and Ireland, and probably under-recorded. It is present in the Channel Islands.

Habitat

It is apparently associated with a wide range of deciduous trees and shrubs in both rural and suburban areas. In contrast to C. ciliata, C. albolineata has been recorded in towns.

Collecting

It is most frequently recorded by beating trees and bushes and by sweep netting vegetation. It is also taken regularly in light traps and occasionally in malaise traps. It often comes into houses in summer.

Season

The adult flight period is similar to, but slightly later than, that of C. ciliata. There are isolated records in weeks 7, 16 and 41.
Map 63  *Mallada flavifrons* (Brauer 1850)
**Mallada flavifrons** (Brauer 1850)

**Distribution and status**

This species is widespread but rather locally distributed in Wales and England, south of a line from the Mersey to the Humber. It is known from the Channel Islands and from Ireland, but only in Co Mayo (Killington 1937). It is apparently absent from Scotland.

**Habitat**

The majority of the records are associated in some way with pine trees, thus supporting Killington's (1937) assertion that the insect shows a preference for coniferous trees. It has been recorded mainly from mixed and deciduous woodlands, with a few records from pure conifer woodlands. There are also records from freshwater marshes and from heather (*Calluna vulgaris* or *Erica* spp.) dominated heathland. It has only rarely been recorded from gardens and never in truly urban areas.

**Collecting**

Most records are from light traps, with some from beating the foliage of trees and a few from malaise traps.

**Season**

The main adult flight period is from June to September, with a peak in July and August and with a few records in weeks 20 and 43.
Map 64  *Mallada prasina* (Burmeister 1839)
**Mallada prasina (Burmeister 1839)**

**Distribution and status**

It is widespread but local in southern and central England, although it is usually common where it occurs. In northern England it is more local and scarce, and it is absent from Scotland. It is very local in Wales and Ireland, though almost certainly under-recorded.

Until recently, *M. prasina* was regarded in Britain as being only a sub-species of *M. ventralis*, even though, in Europe, it was considered to be a full species (eg Principi 1956). Due to this confusion, most earlier records cannot be used. Therefore, all literature records of *M. ventralis* have been omitted, except where there is clear reference to the subspecies or where a specimen has been traced and examined.

**Habitat**

This species is less dependent than *M. ventralis* on the presence of trees. It is found in unimproved and semi-improved grasslands, woodland edges, wetlands, sand dunes and hedgerows. It is also quite common in suburban gardens and town parks with shrubs.

**Collecting**

Almost all the recent records are from light traps, with a few from sweep netting vegetation. Older museum specimens typically lack collecting data.

**Season**

The adult flight period is concentrated in the summer months (weeks 23–35), with outlying records in weeks 18 and 40.
Map 65  *Mallada ventralis* (Curtis 1834)
**Mallada ventralis** (Curtis 1834)

**Distribution and status**

It is widespread and fairly common in England and Wales, although less frequent in the north of England, but present along the eastern sea-board of Scotland. In Ireland, it is known from a single, old record from Co Armagh, and from two more recent records from Wexford in 1976 and Wicklow in 1979. An old record from Wexford (King & Halbert 1910) has not been verified. It has not been recorded from the Channel Islands. [See the comments under *M. prasina* regarding the earlier nomenclatural confusion with that species.]

**Habitat**

It is found in woodland more often than *M. prasina*, but it also occurs regularly in hedgerows and gardens.

**Collecting**

*M. ventralis* has been recorded from several light traps, but it is less frequently taken than *M. prasina*. Unlike *M. prasina*, it is easily beaten from trees, especially birch and sallow.

**Season**

The adult flight period shows a single peak in early July, with the entire seasonal range in the months of May through to August.
**Nineta flava** (Scopoli 1763)

**Distribution and status**

This species is widespread and common in England and Wales, but rather more local in Scotland and Ireland, perhaps because of under-recording. It has not been recorded in Orkney, Shetland, the Outer Hebrides or on the west coast of Scotland. It is known from the Channel Islands.

**Habitat**

It is associated with trees, typically in a woodland setting, but has also been recorded from isolated trees in towns, especially in gardens and parks. Killington (1937) recorded taking adults by beating hazel, lime (*Tilia* spp.), oak and beech, but the more recent data, together with the author's experience in the field, suggest a strong association with oak. Many of the other species of tree from which the author has beaten adults were growing near to oaks.

**Collecting**

Beating the foliage of trees has been the main source of records, and there are a few records from light traps and malaise traps.

**Season**

It is a typical high-summer species, occurring in numbers in June to August and with just a few records in May and in September/October.
Map 67  *Nineta vittata* (Wesmael 1841)
Nineta vittata (Wesmael 1841)

Distribution and status

It is widespread and common in most of Britain, but is more local in Scotland. It has not yet been recorded from Orkney, Shetland or the Outer Hebrides, but it is present on the adjacent north-west coast of the Scottish mainland. It is present in Ireland, with post-1960 records from both the extreme west and the extreme east coasts, suggesting that it is considerably under-recorded. It has not yet been recorded from the Channel Islands. Killington’s (1937) statement that this species is less common than N. flava no longer seems to hold true. It is interesting that even earlier (Withycombe 1924) it was described as an uncommon species. It may, therefore, have increased its range and abundance over the last 70 years.

Habitat

Like N. flava, this seems to be an arboreal species. Larvae have been taken from oak, lime and hazel, but it is probable that it also occurs on other species of deciduous tree.

Collecting

It is most often recorded in light traps, and less frequently in malaise traps. Like N. flava, it has also been beaten from deciduous trees, especially in woodlands.

Season

It is a typical high-summer species, occurring from late May to August and with a few records in September/October.
Map 68  *Nothochrysa capitata* (Fabricius 1793)
**Nothochrysa capitata (Fabricius 1793)**

**Distribution and status**

This species is widespread and locally common in England and Wales. There are only two Scottish records: Tentsmuir Point, Fifeshire, and Loch of Lowes, East Perthshire. It has not been recorded from Ireland.

**Habitat**

Most records support Killington's (1937) assertion that the insect is exclusively associated with conifers, but some are from deciduous woodland. At Richmond Park, Surrey, many examples were taken from oak canopy (Barnard *et al.* 1986).

**Collecting**

Beating pine trees and light trapping are the most frequently recorded methods of capture. Occasionally specimens have been collected by sweeping low vegetation near trees soon after high winds. The Richmond Park specimens were collected by insecticidal fogging of the oak canopy.

**Season**

Most records are from June and July (weeks 23–28), but with a slight second peak of records in late July/early August and isolated records in weeks 20 and 36.
Nothochrysa fulviceps (Stephens 1836)

Distribution and status

This species is extremely local and rare, and has not been recorded since 1958. Killington (1937) records it from Bedfordshire, Berkshire, Devonshire, Durham, Gloucestershire, Hampshire, Kent, Lincolnshire, Shropshire, Staffordshire and Yorkshire. Several of these occurrences cannot be mapped because it has not been possible to localise the records beyond county level. Several old museum specimens have proved to be mis-identified examples of N. capitata and so, in the absence of specimens, it is not possible to accept Killington's records without further investigation.

Habitat

According to Killington (1937), it is confined to the tops of oak trees, but because of the uncertainty about Killington's records (see above), this statement is unconfirmed. In Europe it has been taken in light traps at the edge of mature conifer plantations, though oaks were also present.

Collecting

Killington (1937) recommended beating oak trees using a net on a long pole. In eastern Europe, it comes readily, and in large numbers, to mercury vapour light traps.

Season

It has been recorded only in June (weeks 22, 24, 25 and 26).
The order Mecoptera is represented in Britain by only four species in two families, each containing a single genus. There is a published record of only one species from Ireland.

The Boreidae are represented by the snow flea, *Boreus hyemalis*, a small flightless insect that is mature and active only in the winter.

The Panorpidae are represented by three species of *Panorpa* - the scorpionflies. The vernacular name for this group derives from the appearance of males, the tip of the abdomen of which bears a swollen external genital capsule which is held forwards over the body in a manner similar to the way in which a scorpion carries its sting. The abdomen of female Panorpidae is simple, being tapered to the tip. In both sexes the last few segments of the abdomen are usually a chestnut/orange colour, which contrasts with the darker body. The wings are hyaline with black spots in varying positions, but there is a spotless form of *P. germanica* which occurs in Scotland and Ireland. All three *Panorpa* species may fly together at the same locality.

### Identification

*Boreus hyemalis* is quite unmistakable, see Fraser (1959).

*Panorpa* spp. males can only be reliably separated by the shape of the 'calipers' on the ventral face of the genital capsule. This feature is easily viewed with a x10 hand lens. The illustrations in Fraser (1959) are adequate for the identification of males.

*Panorpa* spp. females can be reliably identified by examination of their ovipositor which are illustrated by Plant (1991c). The key to females in Fraser (1959) is unreliable, as are other traditional methods of separating females (see Plant 1991c).

All three *Panorpa* species may fly together at the same locality.
This species is strongly sexually dimorphic; females have vestigial wings whilst those of the male are modified into stout spines held over the body. These spines are serrated on the inner edge and play a role in mating, which takes place with the female resting on the back of the male.

**Distribution and status**

First recorded in Britain by Curtis (1829), the snow flea was for long considered a great rarity, but, as the distribution map shows, there is a wide
scatter of old records. Most of these earlier records were summarised by Aubrook (1939). This is one of the few British insects to mature during the winter, and its apparent rarity is possibly a reflection on the habits of entomologists. Although most records are from the uplands of Wales, Scotland and the Pennines, there are several records from the lowlands, particularly in the south-east.

It is probable that diligent searching will prove this species to be widespread and even common across much of Britain, although it is conspicuously absent from the south-west peninsula of England. There are apparently no records from Ireland or the Channel Islands.

The species is flightless, which may limit its ability to disperse in areas where suitable habitat is fragmented, such as many heathlands in the lowlands.

Habitat

It is found chiefly on heaths and moors. The eggs are laid in moss on the ground, on walls or on logs, and the larvae live in tunnels constructed between the moss and the substrate. In spite of many literature references to larvae, pupae and adults found in moss, only one (Fraser 1959) names the moss species *Polytrichum commune*. Other species of moss may be utilised. Voucher specimens of moss are requested with all records of *B. hyemalis*, from entomologists who are not familiar with bryophytes. There are more records from high altitudes, but the insect is also recorded from lowland localities.

Collecting

Almost all recent records, where the capture method was stated, were made from pitfall traps, which is predictable for a flightless, ground-dwelling insect. Many of the other records are of adults sitting or moving around on snow, usually in an exposed situation. A few records are of adults, larvae and pupae found by sorting through moss.

Season

The earliest record available is 20 October and the latest is 5 April. Emergence appears to take place later at higher altitudes, with adult insects remaining active until later in the spring than those in lowland areas. Nethersole-Thompson and Watson (1981) mention that adults are sometimes active in early June in the Cairngorms. The larvae overwinter, pupating the following August or September.
Map 71  *Panorpa cognata* Rambur 1842
Panorpa cognata Rambur 1842

Distribution and status

This is the least frequently recorded of the three British scorpionflies. *P. cognata* is widespread but localised and is probably not common. It has been recorded as far north as Glen Cally in Angus, but has not been found in Ireland or the Channel Islands.

Habitat

It appears to be associated with calcareous soils where it is most frequently encountered among brambles (*Rubus* spp.). The difficulties of collecting among brambles may be a contributory factor in the apparent scarcity of this species. It has also been recorded from wet woodland and meadows with tall vegetation.

Collecting

General beating and sweeping are the most frequently recorded methods. There are records from malaise traps, but not, as yet, from light traps.

Season

The adult flight period is the same as for both *P. communis* and *P. germanica*, making it possible to find all three species in the same sweep net! However, numbers of adults peak in July/August, a full two months after the other two species, and at a time when numbers of the other species are declining. In spite of this, it seems to have a short season which is over before that of *P. germanica*, so that time of year is not a guide to identification.
Map 72   Panorpa communis Linnaeus 1758
**Panorpa communis** Linnaeus 1758

**Distribution and status**

It is widespread and common in England and Wales, but is apparently much less frequent in Scotland. It has been recorded from the Channel Islands, but there are no records from Ireland.

**Habitat**

*P. communis* has been recorded from hedgebanks, verges, woodland margins, rough grassland and flower-rich meadows, and adults have been beaten from a variety of deciduous trees. It is frequently recorded at bramble flowers.

**Collecting**

General sweeping and beating of vegetation are the most frequently reported methods of capture. There are also records from malaise traps, but very few from mercury vapour light traps.

**Season**

Adults have been recorded from May to September, but with a peak in late May to the end of July.
Map 73  *Panorpa germanica* Linnaeus 1758
Panorpa germanica  Linnaeus 1758

Distribution and status

This species is widespread and extremely common in England and Wales, becoming less frequent in Scotland where it is recorded north to West Ross. It is also recorded from the Channel Islands, and there are two records from Co Cork in Ireland (Halbert 1907). In Scotland, a form with unmarked wings occurs (f. borealis Stephens), but not all Scottish specimens of P. germanica take this form. One of the two Irish records of this species is of this form.

Habitat

It is recorded in the same habitats as P. communis.

Collecting

The methods used are identical to those for P. communis, except that P. germanica is much more frequently taken in light traps.

Season

The adult flight period is very similar to that of P. communis (mid-May to mid-July), but with a scatter of later records, through to mid-October (week 42).
Peter Kirby provided a valuable review of the British Neuroptera (and allied orders) based on data available to him in 1989 (Kirby 1991). Although distribution maps were not then available, none of the species was estimated to occur in fewer than 16 10 km squares of the National Grid in Britain, this being the threshold for consideration for inclusion in one of the Red Data Book categories as defined by Shirt (1987). However, ten species — Sialis nigripes, Sisyra dalii, Sisyra terminalis, Hemerobius perelegans, Wesmaelius malladai, W. mortoni, W. balticus, Megalomus hirtus, Chrysopa abbreviata and Nothochrysa fulviceps — were assigned to the category 'Nationally Notable'. This category was defined by Kirby (1991) as 'Taxa which do not fall within RDB categories 1 to 3 but which are, none the less, uncommon in Great Britain and thought to occur in fewer than 100 10 km squares of the National Grid'. Remaining species were categorised as being 'Common', 'Local', 'Naturalised' or 'Unknown' (the last being insufficiently known to be placed in any category).

Inevitably, the results from the Lacewing Recording Scheme, since 1989, have overtaken Kirby's work. It is now possible to make recommendations for a number of changes to Kirby's allocation of status assessments of species and to subdivide the Nationally Notable category into Notable A and Notable B, which are defined by Ball (1986) as follows:

Nationally Notable category A (Na)
Nationally Notable species (as defined above) estimated to occur in more than 15 but less than 31 10 km squares of the National Grid

Nationally Notable category B (Nb)
Nationally Notable species (as defined above), estimated to occur in more than 30 but less than 100 10 km squares of the National Grid

However, it is important to stress that these suggested changes are nothing more than recommendations. Any official change of category would need to be made formally by the statutory nature conservation agencies.
List of British lacewings and allies with national status as given by Kirby (1991) and suggested changes of status where appropriate (see Note)

Key to categories and sources of terminology:
RDB3 Red Data Book category 3 – Rare (Shirt 1987)
RDB3* Too recently discovered to be certain of placing (Shirt 1987)
N Nationally Notable (Ball 1986)
Na Nationally Notable A (Ball 1986)
Nb Nationally Notable B (Ball 1986)
L Local (Kirby 1991)
C Common (Kirby 1991)
U Unknown (Kirby 1991)
Nat Naturalised (Kirby 1991)
A Omitted from Kirby (1991) (this Atlas)
** See Justification for change, 7

<table>
<thead>
<tr>
<th>RAPHIDIOPTERA</th>
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<td>Atlantoraphidia maculicollis</td>
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<tr>
<td>Phaeostigma notata</td>
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<td>C</td>
</tr>
<tr>
<td>Xanthostigma xanthostigma</td>
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<td>C</td>
</tr>
</tbody>
</table>

| MEGALOPTERA   |             |          |
| Sialidae      |             |          |
| Sialis lutaria | C          | C        |
| fuliginosa    | L           | C        |
| nigripes      | N           | L        |

<p>| NEUROPTERA    |             |          |
| Coniopterygida |             |          |
| Conwentzia psociformis | C    | C        |
| pineticola    | C           | C        |
| Coniopteryx tineiformis | C    | C        |
| borealis      | L           | C        |</p>
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<thead>
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<td>esbenpeterseni</td>
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<tr>
<td>lentiae</td>
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<td>pseudouncinata</td>
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<tr>
<td><em>Parasemidalis fuscipennis</em></td>
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</tr>
<tr>
<td><em>Aleuropteryx juniperi</em></td>
<td>Nat</td>
</tr>
<tr>
<td><em>Helicoconis lutea</em></td>
<td>U</td>
</tr>
</tbody>
</table>

**Osmylidae**

| Osmylus fulvicephalus | L | C |

**Sisyridae**

| *Sisyra fuscata* | L | C |
| dalii     | N | Nb |
| terminalis | N | Nb |

**Myrmeleontidae**

| Euroleon nostras | A | Channel Is. only |
| Myrmeleon formicarius | A | U |

**Hemerobiidae**

| *Psectra diptera* | L | C |
| *Micromus variegatus* | C | C |
| angulatus | L | L |
| paganus | C | C |
| *Hemerobius humulinus* | C | C |
| perelegans | N | Na |
| simulans | L | C |
| stigma | C | C |
| atrifrons | L | L |
| pini | L | C |
| contumax | L | ** |
| fenestratus | U | RDB3* |
| *nitidulus* | C | C |
| *micans* | C | C |
| lutescens | C | C |
| marginatus | C | C |

<p>| <em>Wesmaelius malladai</em> | N | Na |
| mortoni | N | Extinct |</p>
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<tr>
<td>fuscescens</td>
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<td>L</td>
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**Chrysopidae**

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<td>Cunctochrysa albolineata</td>
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<td>Mallada flavifrons</td>
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<tr>
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<tr>
<td>fulviceps</td>
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**MECOPTERA**

**Boreidae**

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**Panorpidae**

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<td>communis</td>
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<td>C</td>
</tr>
<tr>
<td>germanica</td>
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Note: The Red Data Book and Notable categories are derived solely from present knowledge of the status of the species in Britain. There are insufficient data to make any suggestions regarding the status of species in Ireland or the Channel Islands.

**Justification of suggested changes**

1. **Downgraded species**

Fifteen species given as Local by Kirby have proved, as a result of recent recording, to be quite common. The additional records of *Sialis nigripes* suggest that it does not fit the criteria for Nationally Notable, although it will probably prove to be a local species.

2. **Grading of formerly insufficiently known species**

When *Coniopteryx esbenpeterseni* and *C. lentiae* were first recorded as British their actual status was unclear. It has been shown (Plant 1991a) that both species are native, but have been overlooked and, as researches continue, they are likely to be discovered at additional sites. They do not warrant Nationally Notable status, but having critically examined many hundred *Coniopteryx* specimens, covering the period from 1858 to 1991, there is no doubt that both will prove to be only locally distributed.

3. **Regrading of Nationally Notable species**

*Wesmaelius mortoni* is apparently extinct as a British species. *Sisyra dalii* and *Sisyra terminalis* are likely to prove far more widespread than the present maps indicate, though their range is limited by their habitat requirements; they qualify for the Notable B category.

A further six species listed by Kirby as being Nationally Notable now justify placement in the Nationally Notable A category. *Aleoorteryx juniperi* may have a requirement for native juniper, although the Silwood Park record may indicate that exotic species and cultivated forms could support it. *Hemerobius perelegans* and *Wesmaelius malladai* are restricted to small areas in the north and their habitat requirements are poorly understood. Both *W. balticus* and *C. abbreviata* are confined to stable sand dune systems with marram grass. This is not a common habitat in Britain, and in many areas where suitable dunes do occur they are heavily eroded. The British status of *W. balticus* has been reviewed in detail by Plant (1991b). There are only nine breeding localities known, from which the insect has been recorded at only four since 1960. *C. abbreviata* is known from 17 10 km squares, two more than the threshold for RDB 3 category, but
in only eight of these has it been recorded since 1960. Of these eight 10 km squares, its presence in one is artificial as two squares cover the same site; thus there are only seven recent breeding sites suggesting that the species may have genuinely declined. The recent discovery of *W. balticus* in Scotland (Plant 1991b) suggests that both species are under-recorded, but neither seems likely to exist in more than 30 10 km squares of the National Grid. *C. dorsalis* is an insect of coniferous woodland, but it does not yet seem to have colonised the many even-aged stands of conifers in southern Britain. It is almost certainly under-recorded, but will probably prove to be restricted to relatively few sites.

4 Upgrading from Common to Local

Present evidence suggests that *Coniopteryx parthenia* does not warrant Common status, but it is unlikely to warrant inclusion in the Notable category.

5 Species upgraded to Red Data Book status.

*Hemerobius fenestratus* is recommended for RDB3* status because it is known from only one recent record. *Megalomus hirtus* is found in a single 10 km square in the vicinity of Edinburgh. Its habitat requirements make it a ‘taxon which is localised within a restricted geographical area’. It has been searched for at its former sites in Kincardineshire and elsewhere, but is apparently now absent there. It is not under any immediate threat and therefore does not qualify for RDB2, but any alteration in site management could make it vulnerable to extinction in Britain.

6 Deleted species

*Helicoconis lutea* is now considered not to be a British species. It was listed by Kirby (1991) as having Unknown status.

7 Rare presumed recent natural colonists or introductions

Three species, *Hemerobius contumax*, *Wesmaelius ravus* and *Nothochrysa fulviceps* are very localised and rare in Britain. *H. contumax* was last recorded in 1952 and *N. fulviceps* in 1958, so that both species may now be extinct in Britain. All three species are strictly confined to Scots pine, but occur on that tree out of its current native range in Britain, where it is presumed to be an introduction. Therefore, by implication, these three species may be either natural colonists or accidental introductions. Because Scots pine has been planted in England for several centuries, these lacewings may possibly have been established in England for many years. The three species have not been allocated to a Red Date Book category although
had they been clearly 'native' they would qualify for RDB3. The nativeness, and therefore the RDB status, of species such as these remains unclear, but existing criteria for the consideration of species for RDB status normally exclude species which are known not to be native.
ACKNOWLEDGEMENTS

The author is grateful to the many entomologists whose records have made this Provisional atlas possible. In particular, thanks are due to Joan Morgan, University College of North Wales, Bangor, whose own meticulously kept record cards account for about 95% of the Welsh records, and to Jim O'Connor, National Museum of Ireland, Dublin, for access to most of the Irish records. I am also grateful to the trustees, curators and keepers of the museums listed in Appendix 1 for allowing me to examine the collections in their care. Adrian Riley, at the Rothamsted Experimental Station, Harpenden, deserves special thanks: he organised the collecting of lacewings from the many Rothamsted Insect Survey light traps throughout the country and he sorted (and continues to sort) most of the lacewing material from the bulk samples of Lepidoptera and other orders sent to the Survey. Adrian was also responsible for sorting the lacewings from each nightly catch at the light trap in his own garden, a feat which has elucidated much valuable information on Coniopteryx esbenpeterseni and C. lentiae in particular.

For assistance with validation of records, as print-out from the BRC database, my thanks are due to Bill Ely (south-west Yorkshire), Graham Collins (Surrey), Neil Redgate (northern Highlands), Joan Morgan (Wales) and Jim O'Connor (Ireland).

My thanks are also due to Stephen Brooks and Peter Barnard at the Natural History Museum, London, for valuable discussions, help with validation of records, constructive criticism of some of my wilder ideas, and for reading and critically appraising a draft of this Atlas. I am particularly grateful to Peter for assistance with preparation of the checklist.

Thanks are due also to the staff of the Biological Records Centre, Monks Wood: Val Burton for rapid and accurate computerisation of data, Julian Dring and Henry Arnold for responding most efficiently to my frequent requests for data analysis in a variety of formats, and Brian Eversham and Paul Harding for overseeing the recording scheme and for suggesting it in the first place. I am particularly grateful to Paul for his considerable efforts in editing my original text, for pointing out a number of anomalies and for suggesting improved methods of presenting the data in a readable form. This presentation is as much a result of his endeavours as of mine.

Finally, thanks go to Karen Threlfall and Penny Ward for design and printing.
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Kis, B. & Ujhelyi, S. 1965. *Chrysopa commata* sp. n. and some remarks on the
species Chrysopa phyllochroma Wesm.  


APPENDIX 1: LIST OF MUSEUM COLLECTIONS RESEARCHED

National Museums

Natural History Museum, London
National Museum of Wales, Cardiff
National Museums on Merseyside, Liverpool

County and Regional Museums

Baldock Museum
Colchester Museum
Hancock Museum, Newcastle upon Tyne
Luton Museum
Maidstone Museum
Manx Museum
Oxford County Museum, Woodstock
Museum Service, Newham
Plumstead Museum
Rotherham Museum
Southend Museum
Stoke on Trent Museum
APPENDIX 2: LIST OF LITERATURE RESEARCHED

British Journal of Entomology and Natural History – all years
Bulletin of the Irish Biogeographical Society – partial search only
Bulletin of the Kent Field Club – partial search only
Bulletin of the Société Jersiaise – all years
Entomologist – all years
Entomologists Annual – all years
Entomologist’s Gazette – all years
Entomologist’s Monthly Magazine – all years
Entomologist’s Records and Journal of Variation – all years
Entomologist’s Weekly Intelligencer – all years
Essex Naturalist – all years
Irish Naturalists’ Journal – post 1970 volumes only
Journal of the Entomological Society of the South of England – all years
Journal of the Society for British Entomology – all years
London Naturalist – all years
Naturalist – partial search only
Proceedings and Transactions of the British Entomological and Natural History Society – all years
Transactions of the Norfolk and Norwich Naturalists Society – partial search only
Transactions of the Society for British Entomology – all years
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