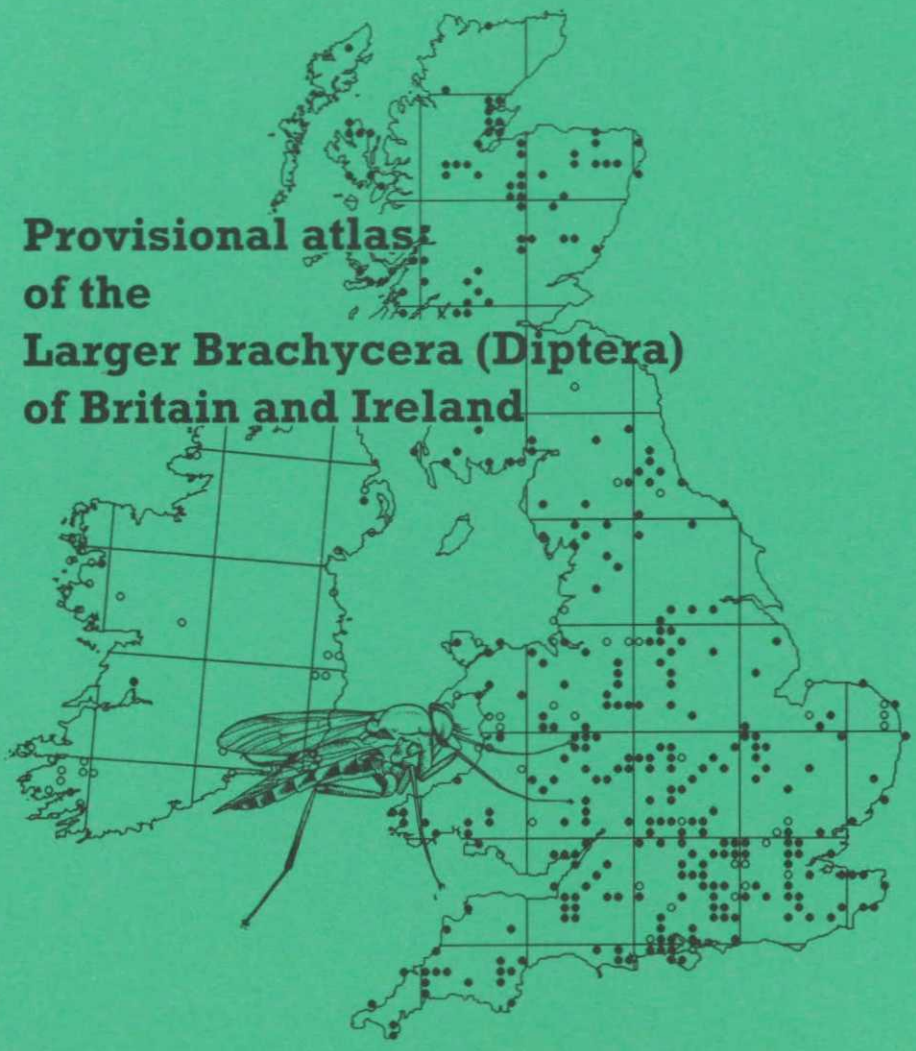
Institute of
Terrestrial
Ecology

Provisional atlas of the Larger Brachycera (Diptera) of Britain and Ireland



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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.

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FOREWORD

The British Isles are possibly unique in having a large resident army of amateur entomologists who freely exchange information without seeking any reward. The Biological Records Centre facilitates this exchange of information on a much larger scale than was possible previously, but the source of records remains the same. This *Provisional atlas of Larger Brachycera* is one of many such publications derived almost entirely from the efforts of amateur naturalists, the group having received little study by academics and even less by professional entomologists in Britain.

One reason for this neglect is that most of these flies cannot be regarded as having major economic importance. The horse flies (Tabanidae) are a possible exception, being potentially important as disease vectors, and the female feeding habits can cause problems for livestock. Most of the larvae of Larger Brachycera are predatory and they must have some influence on pest populations in certain habitats, but their importance has yet to be evaluated.

The group includes some of the most spectacular flies found in Europe. Many of them are sun-loving insects, fond of sitting in open situations where they attract the attention of the casual observer. The British Isles fauna is relatively poor in species, many of which are very local in distribution, and few dipterists have specialised solely in them. On the other hand, almost all dipterists collect or record them, albeit on a casual basis, so that the Larger Brachycera Recording Scheme has been able to gather sufficient records to warrant this *Provisional atlas.*

Until a few years ago I faced the task of collating all the data and writing the species accounts for the Scheme. I know what an enormous task it is, and Martin Drake and the BRC staff must be thanked for undertaking this work. They have provided something of a reward for all the amateur entomologists by publishing this *Atlas.* Undoubtedly its production will promote further recording and it is to be hoped that a further atlas covering all the species will appear soon.

Tony Irwin September 1990

INTRODUCTION

Ever since Verrall (1909) treated a number of related families of the Brachycera together in one volume, this group has been regarded as one unit, a practice reinforced by Oldroyd (1969) in his handbook. Not only are there good systematic reasons for treating the Tabanomorpha (Tabanoidea and Stratiomyidea) and Asilomorpha (Asiloidea and Bombyloidea) separately from the Empidoidea, but the 'Larger Brachycera' also form a coherent collector's group, comprising for the most part large and attractive flies that lend themselves to casual collecting. With a long history of study by amateur entomologists, the intensity of which has increased recently, it is appropriate that the Larger Brachycera should be among the first British Diptera to have their distributions mapped.

The recording scheme was begun in 1976 by Dr A G Irwin, initially with the help of M G Jefferies and Dr J Bowden, and the first of a series of newsletters appeared in 1982. Early on, the Biological Records Centre (BRC) produced a card for the group (RA34) which incorporated a number of changes from Oldroyd's handbook and the checklist (Kloet & Hincks 1976), based mainly on revisions by Chvála (1980), Chvála, Lyneborg and Moucha (1972) and Rozkošný (1973, 1974). The card listed 151 species, including a few that may be extinct (*Solva varia*, *Xylophagus junki*, *Laphria gilva* and *Neoitamus cothurnatus*). Since its production, two species have been formally added to the British list: *Chorisops nagatomii* and *Chrysopilus erythrophthalmus*. Two others, *Ptiolina nigrina* and *Tabanus spodopterus*, are being evaluated and the discovery of a third species, *Oxycera leonina*, will be described soon.

This *Atlas* is still very provisional. It is based on 20 984 records submitted by scheme recorders or extracted from parts of the collections of a few museums, and from an imperfect literature search which would have been still less complete but for the work on rare species by S J Falk (1991). The records are held at the BRC, both on computer and as original cards in the archive. A small proportion of the records submitted early in the history of the scheme were not on BRC record cards and unfortunately escaped inclusion in the computer file on which the maps and tables are based.

As the data base is small and coverage both thin and patchy, BRC considered that it was inappropriate to publish maps of every species at this stage. A selection of about one-third of the species was made to cover the range of types of distribution, rather than merely mapping the most

frequently recorded species. All species are included in a table of vice-county distributions (Table 1). The text for each species includes the flight period and, for the unmapped species, a summary of the distribution by present-day counties, thus complementing the vice-county table and at the same time attempting to keep abreast of county recording by local records centres. The text also frequently includes a brief note on the species' habitats and biology. Because of the difficulty of extracting this information from record cards (it cannot easily be put on the computer) and in classifying habitats based on recorders' descriptions, the text rarely contains new information: it is based partly on published material and largely on the full accounts in the manuscript of *British Larger Brachycera* by A E Stubbs. In view of this forthcoming book, it was felt unnecessary to devote any more space to habitats and biology than was needed to suggest suitable collecting ground and give hints about identifying species with specific habitat requirements. Records have been divided into old and recent, taking the date of publication of Oldroyd's handbook (December 1969) as the criterion. There are two reasons for using a relatively recent dividing date. First, the handbook was the first inexpensive and readily available key to the group since Verrall's work 60 years earlier, and it provided an impetus for collecting. Second, the most important practical use for recording is as a conservation tool: knowledge of the current status of a species is essential in arguing the case for site protection. The Larger Brachycera form a particularly useful indicator group for this purpose because many species are scarce and have specific habitat requirements that allow them to survive only in the best examples of a habitat. For six common species, no distinction has been made between the dates of capture because these maps were produced earlier, for inclusion in a recording scheme newsletter. The recent capture dates for *Stratiomys potamida* were further divided into pre-1980 and more recent to emphasise the expansion of this species.

Oldroyd's handbook has probably been the main identification guide used by recent recorders, but its keys contain a number of confusing and incorrect couplets that have resulted in misidentifications and erroneous records. Many of these errors and those of earlier collectors have been corrected, but only a limited amount of vetting of specimens has been possible during the scheme. Other doubtful records are included but suitably qualified, in the hope that the specimens will be re-examined.

The text includes the status of 43 species listed in the *Insect Red Data Book* (Shirt 1987). This publication uses three levels of threat to the survival of species in Great Britain. Their definitions are quoted below, although the *Red Data Book* should be consulted for the full criteria used in assigning a

species to a category. Note that the emphasis is on threat, not on rarity *per se*.

Category 1 (RDB1 in this text) – Endangered; taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating.

Category 2 (RDB2) – Vulnerable; taxa believed likely to move into the endangered category in the near future if the causal factors continue operating.

Category 3 (RDB3) – Taxa with small populations that are not at present endangered or vulnerable, but are at risk.

Several Larger Brachycera which were not included in the *Red Data Book* because of taxonomic uncertainties probably deserve to be included. Such species are described as 'rare' in this atlas. Species that are not 'rare' are described loosely as scarce, uncommon, frequent or common: these terms are not strictly defined because the level of recording is too low for such precision. Table 1 gives a crude indication of abundance on a national scale, but the ranking is inaccurate for a few species whose distributions have been unusually well researched, eg *Xylophagus ater*, *Symphoromyia immaculata* and *Leptarthrus brevirostris*. Coverage for Ireland is very poor in the data set, and great reliance has been placed on Chandler (1975) for the status of species here.

SUMMARY OF TYPES OF DISTRIBUTION

The most common distribution pattern among the Larger Brachycera is one determined primarily by warmth, resulting in the species being common in the south and becoming scarcer northwards; the northern limit can vary greatly, from just north of the Thames-Severn line to the tip of Scotland. One frequent variant is that, further north, populations become increasingly confined to the warmer coastal belt or, less frequently, to warmer lowland areas inland. Relatively few species show the opposite cline: *Microchrysa cyaneiventris*, *Rhagio notatus*, ? *Spania nigra*, *Thereva lunulata* and *Hybomitra montana*. Six species are apparently confined to Scotland: *Xylophagus cinctus*, *Laphria flava*, *Rhadiurgus variabilis*, *Thereva handlirschi*, *T. inornata* and *T. valida*, whilst two species extend into northern England, *Oxycera dives* and *Symphoromyia crassicornis*. The only species that appear to be equally frequent throughout Britain, and probably Ireland too, are *Rhagio lineola*, *R. scolopaceus* and *R. tringarius*.

An east-west gradient sometimes overlies the north-south trend. Strongly western species that are scarce or absent in the east are *Atherix marginata*, *Beris fuscipes* and *Bombylius canescens*, whilst some are apparently absent from the south-east lowlands of England, eg *Atherix ibis* and *Ptiolina atra*. Surprisingly few seem to be more common in the east than in the west, and the only species that show this trend clearly are *Pachygaster atra*, *Solva marginata* and, possibly, *Eupachygaster tarsalis*.

Sixteen species are coastal. However, with the exception of *Nemotelus notatus*, none is associated solely with maritime habitats in the centre of its range in Europe or Asia (*Hybomitra expollicata* is almost entirely coastal in Europe but not in Asia) (Chvála *et al.* 1972; Rozkošný 1973; Séguy 1926, 1927). As these species approach their northern limits, they become increasingly confined to coastal districts where climatic conditions remain mild. *Oxycera trilineata* and *Oplodontha viridula* show this trend within Britain. High salinity may have a small direct effect in depressing the freezing temperature of the soil, and it is of interest that *Nemotelus uliginosus*, a coastal species in Britain, but not on mainland Europe, is also found at a few saline localities inland, eg parts of the Fens and the Cheshire brine pits.

The species that are confined to the coast in Britain fall into two groups: marshland species all belong to the Tabanoidea, and dune or coastal heath species to the Asiloidea. The marshland species are *Nemotelus notatus*, *N. uliginosus*, *Stratiomys longicornis*, *Atylotus latistriatus*, *A. rusticus*,

Haematopota bigoti, *H. grandis*, *Hybomitra ciureai* and *H. expollicata*. Apart from the two *Nemotelus*, these are all *Red Data Book* species and some have quite specific habitat requirements. A number of aquatic Stratiomyidae that are characteristic of coastal marshes are also frequently encountered inland: *Nemotelus nigrinus*, *N. pantherinus*, *Oxycera trilineata*, *Stratiomys singularior* and *Vanoyia tenuicornis*. Although *Oxycera morrisii* and *O. pygmaea* appear to follow this distribution pattern, they actually use very different habitats.

Species that are confined to dunes should be considered a subset of a larger group that requires warmth and friable soils. These species have active, predaceous larvae that burrow and feed within the soil which therefore must be easily penetrated. Such conditions occur in Britain only in dry heaths and dunes. *Philonicus albiceps*, *Thereva bipunctata*, *T. annulata*, *Phthiria pulicaria* and *Villa modesta* are found on dunes around most of the coast.

Pamponerus germanicus and *Dialineura anilis* are found mostly on the west coast and are rare on the dunes in east Scotland. There are two major regions of inland heaths in England. One forms an interrupted band from east Dorset, through the New Forest and east Hampshire, to West Sussex and Surrey. The other is Breckland on the Norfolk-Suffolk border. These areas show up conspicuously in the distribution patterns of many heathland species, including some that are also frequent on dunes, eg *Dysmachus trigonus*, *Epitriptus cingulatus* and *Thereva fulva*. *Bombylius minor* and *Villa circumdata* are probably now confined to the Dorset-New Forest area, but were once more widespread. *Thyridanthrax fenestratus*, with rare exceptions, has only ever been known from the Dorset-to-Surrey band, and *Atylotus fulvus* is most common here, but is more widespread. The Breckland and Dorset-to-Surrey heaths are the only currently known localities for *Eutolmus rufibarbis*, though it may have been more widespread in the past.

SPECIES ACCOUNTS

Coverage map **Map 1**

The map shows the 10 km squares of the British and Irish National Grids from which records of large brachycerans have been incorporated in the Biological Records Centre database.

STRATIOMYIDAE

Beris chalybata (Forster) 601

Common throughout the British Isles, becoming scarcer towards the north of Scotland; distribution similar to that of *Chloromyia formosa* (Map 5). Larvae have been reared from rotting vegetation, and adults are most frequently found in damp, usually shaded, situations. Flight period late April to mid August, rarely later, peaking in late May to early June.

Beris clavipes (Linnaeus) 602

An uncommon species but nevertheless widely distributed throughout England and Ireland, but very rare in Scotland. Adults are usually taken in damp habitats. Flight period mid May to late July, peaking from the end of May to mid June.

Beris fuscipes Meigen 603 **Map 2**

An uncommon species in England with a western and southern distribution, but rather more frequent in Ireland. Adults occur mainly in fens, marshes and wet woods. Flight period mid May to the end of July, rarely later, peaking in early to mid July.

Beris geniculata Curtis 604

Less frequently recorded than *B. chalybata*, but similarly distributed throughout Britain (cf *C. formosa*, Map 5) and found in the same situations.

Scarce in Ireland. Flight period mid May to early September (one record in early October), peaking in early to mid July.

***Beris morrisii* Dale 605** **Map 3**

This species, which is found frequently in the south, shows a remarkably rapid tailing-off from the Midlands northwards. It is usually found at damp woodland margins and in other shaded situations. The larvae have been reared from decomposing vegetation and from wild angelica (*Angelica sylvestris*) roots. Flight period mid May to early September, peaking in late June to mid July.

***Beris vallata* (Forster) 606** **Map 4**

The commonest *Beris*, found in a wide variety of damp habitats and also in dry grassland. Flight period mid May to late September, occasionally into October, peaking in early to mid July. There are reliable records of adults in March.

***Chloromyia formosa* (Scopoli) 801** **Map 5**

This is the most frequently recorded larger brachyceran. Its pattern of distribution, widespread throughout Britain and Ireland, but becoming scarce towards the north of Scotland, is shared by about 20 other species, so the map for *Chloromyia* is frequently consulted. The adults occur in a wide range of habitats though usually damp, and larvae are frequent in rotting vegetation. Flight period early May to the end of August, occasionally to the beginning of October, peaking in early July.

***Chorisops nagatomii* Rozkošný 901** **Map 6**

As this species was first described in 1979, the records suggest that it is probably not uncommon in the south, although *C. tibialis*, with which it was previously confused, has been more frequently recorded than *C. nagotomii* since this date. Its habitats range from fens to a chalk pit, and include a suburban garden where it was first discovered in the British Isles. Flight period early May (exceptional) to early September, mostly during mid to late August.

Chorisops tibialis (Meigen) 902

A frequently encountered species with a similar distribution to *Oxycera rara* (Map 14), but extending to south Cumbria and Ireland. Adults are usually found in shade in a range of habitats, such as wood margins, scrub and fen. Flight period mid June to early September, with an ill-defined peak in mid to late July.

Eupachygaster tarsalis (Zetterstedt) 3005

A scarce species with modern records for only four localities in woodland and parkland in Berkshire (Windsor Forest), Cambridgeshire and Hampshire (New Forest), and in Dorset in 1960. At the turn of the century, it was also recorded from Greater London, Somerset and the Spey Valley, the last being queried by Brindle (1962). Larvae have been found in rot holes of beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*), poplar (*Populus* spp.) and pine (*Pinus* spp.). Flight period early June to late July.

Microchrysa cyaneiventris (Zetterstedt) 2401 **Map 7**

This is the least common *Microchrysa*, but is still a frequently recorded species. Unlike its congeners, it is more frequent in the north and west, usually in deciduous woodland or by shaded water margins. The larvae have been found in decaying vegetation and moss. Flight period early May to mid September (one record in early October), common from mid June to mid July.

Microchrysa flavicornis Meigen 2402

The most frequent species of the genus, distributed like *Chloromyia* (Map 5). Adults are found in many habitats, including woods, gardens, hedgerows, fens and heath. Flight period early May to late September, peaking in July.

Microchrysa polita (Linnaeus) 2403

The distribution and habits of the species are very similar to those of *M. flavicornis*. Larvae have been recorded from garden compost and cow

dung. Flight period early May to mid October, with no peak, but common from late May to late July. There are records for mid April and mid November. This species flies distinctly earlier than its congeners.

Nemotelus nigrinus Fallén 2501

This is the more frequent of the two 'inland' species of *Nemotelus*. Its distribution is similar to that of *Oplodontha viridula* (Map 12), but it does not extend beyond south Cumbria in the west and Northumberland in the east, apart from an isolated record from Tayside. There are scattered records from Ireland. Adults are found in fens, wet meadows and grazing marsh ditches, mainly those with base-rich influence. The larva remains undescribed, but is presumably amphibious like those of other *Nemotelus* species. Flight period mid May to mid August, peaking in early to mid July.

Nemotelus notatus Zetterstedt 2502

This is one of the coastal *Nemotelus* species and occurs around the entire Irish, English and Welsh coasts, extending to Dumfries and Galloway in the west and to Lothian in the east. Adults are usually found in salt marshes, estuaries, brackish ditches behind sea walls, and at inland saline sites such as the Cheshire brine pits. Larvae have been found in saline pools. The flight period is very short with few records outside the period late June to mid August, and with a strong peak in early to mid July.

Nemotelus pantherinus (Linnaeus) 2503 **Map 8**

Somewhat less frequently recorded than the other species of *Nemotelus*. It is as frequent on freshwater coastal marshes as on lowland inland fens and wet meadows where it may be locally common. The larvae are amphibious. Flight period short, mid June to mid August (exceptionally mid September), with a strong peak in early July.

Nemotelus uliginosus (Linnaeus) 2504 **Map 9**

This is the only larger brachyceran found in salt marshes, estuaries and sea wall ditches around the whole British and Irish coast, although the

Scottish coast is admittedly sparsely populated. Unlike *N. notatus*, this species also occurs inland, e. g. in relict saline areas in Cambridgeshire, as well as Cheshire where both occur. Larvae have been found in drying saline pools. Flight period late May to early September, strongly peaking in July.

Neopachygaster meromelaena (Dufour) 3004

A species whose modern distribution is mainly south-eastern (Kent, Surrey, Greater London, Hampshire, Berkshire, Buckinghamshire, Cambridgeshire, but extending to South and North Yorkshire, with records from the 1950s and 1960s from Hereford and Worcester, Lancashire and Oxfordshire. There is one early record for the Spey Valley (Highland). The larvae have been found under dead bark of holly (*Ilex aquifolium*), horse chestnut (*Aesculus hippocastanum*), elm (*Ulmus* spp.), beech (*Fagus sylvatica*) and willow (*Salix* spp.), although mostly from poplar (*Populus* spp.); larvae are more easily found than are the adults. Flight period June to late August with most records in June.

Odontomyia angulata (Panzer) 2701

A very rare (RDB1) fenland species. There are three old records from the Norfolk Broads, Wicken Fen (Cambridgeshire) and Suffolk, and three from one area of the Somerset Levels in the period 1947-51. The only recent records come from two sites in Norfolk, where its larvae have been found among vegetation in shallow pools and from an Oxfordshire fen. Flight period late June to early August.

Odontomyia argentata (Fabricius) 2702

A rare (RDB2) fenland species that has declined drastically, although Verrall (1909) considered it uncommon in his day. Old records come from south-east England, from Norfolk to Somerset, and recent records from single sites in Cambridgeshire, Suffolk and Norfolk and two Hampshire sites. It has an early flight period, from late April to early June, with a peak in May. Adults have been found on the flowers of hawthorn (*Crataegus* spp.) and sallow (*Salix* spp.).

Odontomyia hydroleon (Linnaeus) 2703

In 1986 a thriving colony was discovered in Dyfed, in a meadow with seepages and panicled sedge (*Carex paniculata*). Adults were feeding at hogweed (*Heracleum* spp.) flowers. Another site was found in Yorkshire in 1988. These are the first records for Britain, although Verrall (1909) mentioned specimens whose identity he was unable to confirm, from Holywood in Ireland, Berkshire and the London area.

Odontomyia ornata (Meigen) 2704 **Map 10**

A rare (RDB2) species with more recent than old records, mostly as a result of collecting larvae in its preferred habitat. It is unusual among Stratiomyidae in now being confined to freshwater grazing marshes, and it is frequent in the Somerset and Gwent Levels. Adults are frequently found at hemlock water dropwort (*Oenanthe crocata*) flowers. The larvae are truly aquatic and occur in floristically rich sites with dense submerged vegetation. Flight time late April to late July, peaking in late June.

Odontomyia tigrina (Fabricius) 2705 **Map 11**

An uncommon species which may be locally frequent at suitable habitats, which are mainly ponds and freshwater grazing marsh ditches with dense emergent vegetation. The larvae are truly aquatic and require a moderate depth of water all year. Flight period mid May to mid July, most frequent from late May to mid June.

Oplodontha viridula (Fabricius) 2706 **Map 12**

This is the most common of the truly aquatic Stratiomyidae, and recording has shown it to be less rare than previously thought. It is more widespread in Ireland than the map indicates. Its larvae may be locally common in a range of well-vegetated water bodies, such as ponds, drainage ditches, fens, seepages and the margins of slow streams. Flight period early June to early August, exceptionally into September, peaking from late June to mid July.

Oxycera analis Meigen 2901

This RDB2 species, which was as rare in Verrall's time as today, has only been recorded in southern England, Leicestershire being the most northerly county. Old records include Dorset, Somerset, Hereford and Worcester, Berkshire and Kent, and recently it has been found in Dorset, Oxfordshire, Hertfordshire, Cambridgeshire and Kent. The habitats are varied, but are mostly fens or marsh with some shade. A larva was recently found in Kent in silt beside a chalk stream just inside a wood. Flight period late May to end July; most records are in June.

Oxycera dives Loew 2902

A rare (RDB2) fly that is distinguished by being the only truly northern stratiomyid. Early records came from the Grampian Mountains and Lancashire (1954). Recent records are from Tayside, the Galashiels area of Borders, Lower Teesdale (Durham), North Yorkshire and moorland in Northumberland. The breeding sites are wet mossy flushes in meadows, moorland or woodland where there is some base-rich influence. Flight period mid June to early September; most records are in July.

Oxycera fallenii Staeger 2903

Very rare (RDB2). Two records from Wicklow, Ireland, one coming from a wet mossy seepage going into alder (*Alnus* spp.) wood, between 1934-1940, and one unconfirmed report from the Suffolk coast in 1987. Flight period June.

Oxycera morrisii Curtis 2905

A rare (RDB2) species with a scattered distribution. About half of the modern records come from coastal cliffs, landslips and grazing marshes, from Cornwall to the Isle of Wight, Somerset, north Wales, Anglesey, Lancashire, Dumfries and Galloway, Suffolk and Norfolk, and the remainder inland from a further eleven counties up to Lancashire. Old records covered four more counties, including Durham. There are old records from several Irish counties. Adults are found at seepages associated with landslips and springs, and occasionally in fens. The flight period is short, late June to early August, with a peak in early to mid July.

Oxycera nigricornis Olivier 2904

One of the more frequent *Oxycera*, recorded throughout England south of the Wash, with sparse records northwards to Durham. The overall distribution is a slightly more south-eastern version of that for *O. rara* (Map 14); it has not yet been recorded from Wales. Irish records are clustered in several eastern counties and include two recent ones from Meath. Adults are found in fens, carr, pond and river margins with seepages, and may be locally numerous. The aquatic larvae live in shallowly submerged vegetation or are amphibious in wet litter. The flight period is short, from early June to mid August, peaking strongly in July.

Oxycera pardalina Meigen 2906

A rare (RDB2), predominantly western species, with scattered recent records from Devon, Dorset, Somerset, Avon, Hampshire, Gloucestershire, Hereford and Worcester, Clwyd, Gwynedd and Lancashire in the west, and Lincolnshire, North Yorkshire and Durham in the east, with one record from Grampian and several from Borders. There are clusters of old records from the Pennines (Greater Manchester, Derbyshire, North Yorkshire) and Hereford and Worcester, and a single Scottish record from Strathclyde. There are old Irish records for Dublin and Kildare. The overall distribution is similar to that of *Atherix ibis* (Map 22). It is usually found in hilly country, and is associated with small calcareous streams in scrub or at a woodland edge. The flight period is short, from early June to early August, with no obvious peak.

Oxycera pygmaea (Fallén) 2908 **Map 13**

This is the most widely distributed *Oxycera*, but is scarce. Like *O. morrisii*, about half the records come from the coast. It is usually found at base-rich seepages and springs in open fen or grassland, but also in woodland on limestone where the larvae live in saturated moss in seepages and trickles. Flight period late May to late August, with a more extended peak than most *Oxycera*, from mid June to mid July.

Oxycera rara (Scopoli) 2907 **Map 14**

Although this is the most frequently recorded *Oxycera*, it is nevertheless

local and never common. Its absence from Ireland appears to be genuine. Its habitats include wet meadows, grazing marshes, ponds, fens, and springs and seepages on coastal cliffs, landslips and hillsides. Larvae have been found in moss in open seepages and in hoof prints in wet meadows. Flight period early June to late August, frequent throughout July. There is one record for late September.

Oxycera terminata Meigen 2909

A rare southern species (RDB2) with only three currently known populations, in Rockingham Forest (Northamptonshire), Somerset and the Monnow valley (Hereford and Worcester) where it has been known for some time. Old records came from Dorset, Avon, Warkwickshire and Bedfordshire. Its habitats include shaded sandy river banks (Monnow) and a limestone stream. Flight period early June to late July; most records are from late June to early July.

Oxycera trilineata (Fabricius) 2910

This species is not infrequent, though local, in England south of a line from the Wash to the Severn and along the south Wales coast, but it is scarcer northwards to Highland. It has been recorded in a number of coastal counties in Ireland. The overall distribution is similar to that of *Nemotelus pantherinus* (Map 8), with many coastal localities. It is most frequent on coastal grazing marshes, but is also found in fens, wet meadows, and seepages and springs on coastal landslips. The larvae are amphibious and can tolerate mildly brackish conditions. Flight period early June to mid August, exceptionally late September, peaking strongly in late June to mid July.

Pachygaster atra (Panzer) 3001 **Map 15**

This is the most common Pachygasterinae species and shows a pronounced gradient in abundance from the south-east to the north and west. Larvae have been found in beetle burrows, rotting wood, and under bark of elm (*Ulmus* spp.), beech (*Fagus sylvatica*) and poplar (*Populus* spp), though they may also possibly occur in rotting leaves. Adults are not always found in areas where old trees are present; for example, they occur in fens and coastal landslips as well as in woods and old hedgerows. Flight

period early June to mid August with occasional occurrences until late September; most records are from late June to late July.

Praomyia leachii (Curtis) 3002

Not infrequent in southern England and Wales, and distributed similarly to *P. atra*, though the records are less concentrated in the east. The only Irish records are from Co. Dublin. Apart from the presence of tree cover, hedges or scrub, the adults' habitats have not been clearly defined.. Larvae occur in umbellifer roots and in decaying deciduous trees. Flight period late June to late August, peaking in early to mid July. There are occasional records in May, September and October.

Sargus bipunctatus (Scopoli) 3801

Frequent and with a distribution similar to *Chloromyia* (Map 5), though scarce in Scotland. In Ireland it has been recorded mainly in the east, though there is no reason to suppose that it should be restricted in its distribution. It is a woodland edge species and larvae have been recorded from cow dung and rotting vegetation. The flight period is late, from early July to late October (rarely after mid October), and peaks in September. There are single records from the end of May, early November and late December.

Sargus cuprarius (Linnaeus) 3802

This is an uncommon species that has been confused with *S. iridatus* too often for the records to be reliable: for example, none of the many specimens in the Natural History Museum, London are true *cuprarius* (A E Stubbs, pers. comm.). Authentic specimens exist in the Hope Department collections (Oxford), and there is a confirmed record from the Pevensey Levels (East Sussex). Unconfirmed records come from many English counties, south Wales, and Lothian in Scotland. Flight period of purported *cuprarius* is April (exceptional), June to early September.

Sargus flavipes Meigen 3804

Frequent and distributed similarly to *Chloromyia* (Map 5). It is common

and widespread in Ireland. Its habitats and biology are similar to those of *S. bipunctatus*. Flight period long, mid May to mid October, peaking in August.

***Sargus iridatus* (Scopoli) 3803**

The commonest *Sargus* and distributed similarly to *Chloromyia* (Map 5); it is the commonest species in Scotland and may prove to be marginally more common in the east of Britain than *S. flavipes*. It is common and widespread in Ireland. Biology and habitats similar to those of *S. bipunctatus*. Flight period early May to mid September, peaking in July.

***Stratiomys chamaeleon* (Linnaeus) 4101**

A very rare species (RDB1), once widely but sparsely distributed in a number of counties, south of a line from the Humber to the Mersey, although most of these records were made at the turn of the century. More recently it was found in Suffolk (1953), at two Oxfordshire sites, one being a previously known locality (1978-80), and at two sites on Anglesey (1985-87). The Oxfordshire sites are an old quarry with partly shaded mossy pools and fen carr with seepages. On Anglesey, larvae were found in base-rich seepages in fen and adults on hogweed (*Heracleum* spp.) flowers. Flight period early June to late August, with most records in July.

***Stratiomys longicornis* (Scopoli) 4103** **Map 16**

A rare (RDB2) species apparently confined to grazing marshes and salt marshes from the Solent (Hampshire) to Essex, where the larvae live on mud in strongly brackish pools and ditches. The inland records from Wiltshire and Wicken Fen (Cambridgeshire) are unlikely to represent breeding populations. Flight period late May to mid July, peaking in late May to mid June.

***Stratiomys potamida* (Meigen) 4104** **Map 17**

This is the only species of larger brachyceran that has become genuinely more common recently, and three date categories have been used on the map to demonstrate the surge of records in the 1980s. The larvae are

amphibious and live mainly in shaded seepages, eg at stream margins, in woods and on valley sides, and to a lesser extent in heavily vegetated ponds and ditches. Flight period late May to early September, with a peak from late June to late July.

Stratiomys singularior (Harris) 4102 **Map 18**

A scarce species found mostly in estuarine marshes and coastal grazing marshes, and more rarely in inland fens. The amphibious larvae live in mud and shallow water with emergent vegetation, and prefer mildy brackish conditions. Flight period late May to early September, though most records are between late June and mid August, peaking in July.

Vanoyia tenuicornis (Macquart) 4601 **Map 19**

Although an uncommon species, there are many post-1980 records, suggesting that either it is becoming more common or collectors have overlooked it in the past. However, apart from one Humberside record, the new records do not represent a marked extension of its pre-1969 range. Adults occur in coastal marshes and landslips, fens and wet meadows where they are often found on the foliage. Flight period early June to mid August, peaking in July.

Zabrachia minutissima (Zetterstet) 3003

The only recent records of this species are from Surrey, but it was widespread in Hampshire, Somerset, Buckinghamshire, Cheshire, Merseyside, South Yorkshire, Grampian, Highland). It has recently been added to the Irish fauna, from Co. Galway. The larvae live under the bark of pine (*Pinus* spp.). Flight period June to July.

XYLOMYIIDAE

Solva maculata (Meigen) 4801

A rare species (RDB2) though still found recently at all three of its main previously known localities, the New Forest (Hampshire), which probably

contains the largest population, Windsor Forest and Silwood Park (Berkshire), and Epping Forest (Essex); there is an old record for north London. It is a species of ancient forests where its larvae live in dead wood and rot holes, so far recorded only from beech (*Fagus sylvatica*) and oak (*Quercus* spp.). Adults are less frequently found than larvae. Flight period late May to late July, with no discernible peak.

***Solva marginata* (Meigen) 4802** **Map 20**

A rare species (RDB2) of lowland ancient woodlands, though well recorded recently from many new sites. Its larvae are as easy to locate as the adults and have been found mostly in dead poplar (*Populus* spp.), but also in dead oak (*Quercus* spp.), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and walnut (Juglans spp.). Flight period mid June to mid August, peaking strongly in June.

***Solva varia* (Meigen) 4803**

Probably extinct as it is still known only from the two specimens mentioned by Verrall (1909) in the Stephens collection.

XYLOPHAGIDAE

***Xylophagus ater* Meigen 4901** **Map 21**

As a result of a thorough literature search and field surveys by Clements and Alexander (1987), this is the only uncommon larger brachyceran whose distribution is well described; the number of records does not reflect its true status relative to other species. These authors suggest that its distribution, which is split into a large north and west block and a distinct south-eastern one, may be explained by climate, especially rainfall and humidity which are higher in the areas where *X. ater* occurs than in the intervening lowland belt. It is confined to ancient woodland sites, including pasture woodland. Like *Solva* spp., its larvae are more easily found than adults and they live under the bark of many species of deciduous trees, mostly oak (*Quercus* spp.), beech (*Fagus sylvatica*), birch (*Betula* spp.) and ash (*Fraxinus excelsior*), though there is one record from pine (*Pinus* spp.). Flight period early May to late August, peaking in late May to mid June.

Xylophagus cinctus Degeer 4902

This rare species is one of six larger brachycerans known only from Scotland and whose distributions are exemplified by that of *Rhadiurgus variabilis* (Map 53). *X. cinctus* has been recorded in ancient pine forest of the Grampian Mountains from Loch Rannoch to the Spey valley and from Glen Affric, though the only two recent records are from Rothiemurchus Forest. The larvae live in the decaying wood and under bark of dead pines (*Pinus sylvestris*). Flight period mid May to mid June.

Xylophagus junki Szilády 4903

Still known from only a single specimen from Glenmore Forest, Grampian, June 1913, and classed as RDB1.

RHAGIONIDAE

Atherix ibis (Fabricius) 301 Map 22

An uncommon species which is probably genuinely absent from the eastern lowland area of England where its larval habitat, sandy sections of fast-flowing streams and rivers, is scarce. Records of adult *Atherix* understate the distribution because river biologists report that the larvae are more widespread. Flight period early May to mid July, rarely to mid August, peaking in early to mid June.

Atherix marginata (Fabricius) 302 Map 23

Less common than *A. ibis* and with a far more restricted westerly distribution not shared by any other non-coastal larger brachyceran. The records for London and Kent are quoted by Verrall (1909) and date from the early or mid 19th century; they seem unlikely localities in view of the other records. The larvae live in fast streams and rivers. Flight period late June to mid August, peaking in mid July.

Atrichops crassipes (Meigen) 401

A rare, southern species (RDB3) recorded recently from the River Rother

(East Sussex), the Kennet and Avon Canal (Berkshire) and the River Monnow (Hereford and Worcester). There are old records from the New Forest (Hampshire). The larvae live in rivers, especially those on calcareous rocks. Flight period July.

Chrysopilus asiliformis (Meigen) 1001 **Map 24**

A frequent species found in wood and in tall damp vegetation in the open. Flight period mid June to late August, peaking strongly in July, and with single records for the end of May and mid September.

Chrysopilus cristatus (Fabricius) 1002 **Map 25**

One of the most common larger brachycerans, found in many damp habitats, especially on tall vegetation in marshes and fens. The map understates its distribution in Ireland where it is numerous in wetlands. The larvae have been recorded from rotting wood and vegetation, and from damp and wet soil, the latter probably being the more usual habitat. Flight period end of May to beginning of September, peaking late June to mid July.

Chrysopilus erythrophthalmus Loew

Very rare (RDB2), known from only two localities, Swaledale (North Yorkshire), 3.7.1979, and Stoke Plantation (Hereford and Worcester), 1.7.1896, both localities being in hilly country with shaded stony streams. The larvae live in cold streams among moss and under stones.

Chrysopilus laetus (Zetterstedt) 1003

Very rare (RDB1) and until recently recorded only from Windsor Forest and Windsor Great Park (Berkshire) where it is still occasionally found. In 1988 it was found in Cambridgeshire. Most records have been obtained from rearing larvae which live in rotten beech (*Fagus sylvatica*). Flight period June-July.

Ptiolina atra Staeger 3501

The distribution pattern of this rare species is similar to that of *Rhagio notatus* (Map 26), with most records from Scotland and northern England and single records from Shropshire, Mid Glamorgan, Devon and Hampshire. Only two records are recent - Grampian and Durham. The species is probably associated with marshes. Flight period mid May to mid June.

Ptiolina obscura (Fallén) 3502

Scarce but widespread. Recent records from Grampian, Tayside, Durham, North Yorkshire, Cumbria, Lancashire, Cambridgeshire, Buckinghamshire, Hampshire, Wiltshire, Avon and Dorset; old records from Derbyshire, Gwynedd, Mid Glamorgan, Hereford and Worcester, and Kent. In Ireland it is known from two recent records from South Kerry and Wicklow. Adults have been recorded from damp woods and fens, frequently by streams. Larvae occur in thin moss, eg on tree trunks. Flight period mid June to mid July, and therefore overlapping very little with *P. atra*.

Another closely related species, *P. nigrina* (Wahlberg), is present in the British Isles so all records will need to be re-evaluated (M C D Speight, pers. comm.).

Rhagio annulatus (Degeer) 3701

Because of its similarity to *R. tringarius*, this rare species (RDB3) may have been overlooked. There are only three recent records from Dorset, Oxfordshire and Westmeath, and one from Surrey in 1968. Old records came from Hereford and Worcester, and Oxfordshire. It has been found near water in damp deciduous woods and in a dry chalk wood. Flight period mid May to early July, mostly in June.

Rhagio lineola Fabricius 3702

Common throughout Britain and Ireland and usually found on tree foliage in a wide range of habitats. Its pattern of distribution is similar to that of *R. scolopaceus* (Map 27). Flight period early May (exceptional) to early October, most common throughout July and early August.

Rhagio notatus (Meigen) 3703 **Map 26**

This is one of the few frequently recorded northern species that tail off markedly south of the Pennines. Its habitats include open woodland and damp pasture. Flight period late May to early July, with sporadic records until late August.

Rhagio scolopaceus (Linnaeus) 3704 **Map 27**

Very common throughout Britain and probably throughout Ireland. Flight period early May to early September, peaking in June; scarce in August.

Rhagio strigosus (Meigen) 3705

A rare species (RDB3) recorded at four sites in the Thames Valley in Oxfordshire and Berkshire from 1957 to 1980, and several times from Box Hill, Surrey, from 1954 to 1981. It may be associated with chalk scrub. Flight period mid June to late July, with no discernible peak.

Rhagio tringarius (Linnaeus) 3706

Common throughout Britain and with a similar distribution to *R. scolopaceus* (Map 27) in marshes, wet meadows and water margins. It is probably widespread in Ireland. Flight period early May to October, common from mid June to mid August, with a low peak in July.

Spania nigra Meigen 4001

Scarce but widely distributed throughout Britain and probably more common in Scotland than in England and Wales, so that its pattern of distribution is similar to that of *Rhagio notatus* (Map 26). Recent records extend across northern Scotland, northern England, Norfolk, Kent and Hampshire, whilst old records include Shropshire, Hereford and Worcester, Gloucestershire and Mid Glamorgan. The only known Irish records date from the early 19th century. Adults occur in both open and wooded situations, sometimes in association with liverworts, from which *Spania* has been reared on the continent. Flight period late May to the beginning of August, but mostly in early and mid June.

Symphoromyia crassicornis (Panzer) 4201 **Map 28**

A northern, upland species that is frequent in Scotland and less so in northern England (cf *Rhagio notatus*). It overlaps with *S. immaculatus* in the southern Pennines. Adults have been recorded from hillside seepages, stream and river banks, deciduous woodlands and wet meadows. Flight period mid June to early September, mainly late June to mid July.

Symphoromyia immaculata (Meigen) 4202 **Map 29**

An uncommon southern species found on dry calcareous grassland. Flight period early June to early August, mainly late June to early July.

TABANIDAE

Atylotus fulvus (Meigen) 501 **Map 30**

An uncommon heathland species most frequently found in the New Forest (Hampshire) and Dorset heaths. Flight period mid June to mid August, commonest throughout July.

Atylotus latistriatus (Brauer) 502 **Map 31**

A rare species (RDB3) confined to salt marshes and similar coastal habitats. All the recent records come from districts where it has already been known for some time. Flight period early July to late August.

Atylotus plebejus (Fallén) 503

The two old and one unconfirmed recent records of this very rare species (RDB1) come from bogs on the Cheshire Plain - Abbots Moss and Delamere Forest (Cheshire) and Whixall Moss (Clwyd). Flight period mid to late July.

Atylotus rusticus (Linnaeus) 504

A very rare species (RDB 1) found on coastal grazing marshes on the south coast at Farlington (Hampshire), Pevensey and Lewes Levels (East Sussex). There are old records from Cambridgeshire. Flight period June to July.

Chrysops caecutiens (Linnaeus) 1101 **Map 32**

Adults are usually associated with wet woodland and carr, or nearby. Flight period mid May to early September, peaking from late June to late July.

Chrysops relictus Meigen 1102

Less frequent than *C. caecutiens* in England, but the commoner of the two in Scotland; its pattern of distribution resembles that of *Chloromyia* (Map 5). It is common in Ireland. Its habitats include fens, bogs and alluvial riverside meadows. Flight period mid May to early September, common throughout July. There is one record for late April.

Chrysops sepulcralis (Fabricius) 1103

Until it was recently recorded from the New Forest (Hampshire) and Newton Stewart (Dumfries and Galloway), this rare species (RDB2) was thought to be confined to the Dorset heaths. The confirmation of its presence in Scotland suggests that records from Tayside and Highland quoted by Verrall (1909), together with some recent records, may not be merely dark forms of *C. caecutiens*, as previously thought. Adults are found in bogs. Flight period mid July to late August, peaking in early August.

Chrysops viduatus Fabricius 1104

Uncommon but widespread in Wales and England, though most frequently recorded in the Dorset heaths and New Forest (Hampshire) and scarce north of the Midlands; its distribution resembles that of *Leptogaster cylindrica* (Map 47). Its habitats are similar to those of *C. caecutiens*. Flight period mid June to late August, with one record in late September, peaking in early and mid July.

Haematopota bigoti Gobert 1701

A rare species (RDB3) restricted to salt marshes and similar habitats of the Thames Estuary (Essex, Kent), Solent (Dorset, Hampshire), Severn Estuary (Somerset, Gloucestershire), Anglesey and Solway (Dumfries and Galway), with old records from the Ribble Estuary (Merseyside), Spurn

Peninsula (Humberside) and the Wash (Lincolnshire). An inland record from Suffolk needs checking. Flight period early July to late August, mostly in July.

Haematopota crassicornis Wahlberg 1702 **Map 33**

Widely distributed throughout the British Isles though less frequently recorded than *H. pluvialis*, except in upland Scotland where it may be the more frequent of the two species, and scarce in the lowland eastern counties of England. Its habitats are similar to those of *C. caecutiens*. Flight period mid May to early September, peaking from mid June to mid July.

Haematopota grandis Meigen 1703

The only recent records come from Sudbourne marshes and Walberswick NNR (Suffolk), Tywyn Burrows (Dyfed) and the Severn Estuary (Gloucestershire) although it was previously known from the Essex and Thames marshes (Kent), Solent and Isle of Wight, (Hampshire), West Glamorgan and, dubiously, inland in north Hampshire. Although this rare species (RDB3) is restricted to coastal localities, its habitat may be very slightly brackish, transitional marsh. Flight period late July to late August.

Haematopota pluvialis (Linnaeus) 1704 **Map 34**

This is by far the most common tabanid in the British Isles. It appears to have no clear habitat preferences. Flight period late May to early September, peaking in late June to mid July.

Hybomitra bimaculata (Macquart) 1801 **Map 35**

One of the six moderately frequent tabanids, though scarce north-east of the Midlands and showing an apparent decline in the east of its range. The adults are mostly recorded from woodland edge habitats and sheltered fen and marsh, especially heath woodland with wet hollows and pools. Flight period early May to mid August, most common from early June to mid July. There is a record for mid April.

Hybomitra ciureai (Séguy) 1802

A rare (RDB3), south-eastern species found on and near the coast, mostly in marshes, although its precise habitat is unknown. Recent records come from all coastal counties from East Sussex to Norfolk; there are no old records outside this area. Flight period mid June to mid August.

Hybomitra distinguenda (Verrall) 1803

This is one of the few widespread species among the large tabanids, being found throughout Britain and Ireland, though scarce in the north. Its distribution is similar to that of *Chloromyia* (Map 5), though there are few records east of the Pennines. Its habitats include wet heath, bog, wet woodland edge and wet meadows. Flight period early June to late August, peaking in early to mid July.

Hybomitra expollicata (Pandellé) 1804

Very rare (RDB1) and restricted to a few brackish, coastal marshes in Essex, and Chichester Harbour (West Sussex); there is an old and probably erroneous record from the Dorset heaths. Flight period July.

Hybomitra lurida (Fallén) 1805

This rare species is one of the few larger brachycerans that are virtually confined to Scotland. Most records, both old and recent, come from the area between the Spey valley and Golspie (Highland, Grampian) and from Loch Lomond (Strathclyde). A record from Whixall Moss (Shropshire) is probably an error. Flight period early June to July, though almost entirely early to mid June.

Hybomitra micans (Meigen) 1806

Rare but widespread in Wales and England. The three recent records are from Hafren and Coed Sarnau Forests (Powys) and Wytham Wood

(Oxfordshire); early records stretch from Highland to Devon, although most are from southern England. Many sites are woods. Flight period mid May to early July, peaking in mid June.

***Hybomitra montana* (Meigen) 1807** **Map 36**

This species is apparently more at home in the far north of Scotland than is any other widespread larger brachyceran. It is found in upland valleys, moorland and bogs, including lowland bogs outside of upland Britain. Flight period early June to early August, peaking in early to mid July.

***Hybomitra muehlfeldi* (Brauer) 1808**

Records for this rare species must be viewed cautiously as it has been the subject of considerable taxonomic discussion (see Oldroyd 1969) and may easily be confused with *montana* and *bimaculata*. The most reliable records are from the Norfolk fens and Crymlyn Bog (West Glamorgan). Other recent records include another West Glamorgan bog, Cheshire, Warwickshire, and an unlikely one from the north Kent marshes. All old records from Staffordshire, Oxfordshire, Yorkshire and south-west Ireland must be checked. Its habitat includes fens and bogs. Flight period early June (exceptional) to early August, mostly July.

***Hybomitra solstitialis* (Meigen) 1809**

Chvála, Lyneborg and Moucha (1972) describe this species as local and rare. They imply that they have seen specimens from France and only documentary material (=records) from England, Denmark and Finland; the Danish localities were coastal. Oldroyd (1969) was presumably certain of the identification of two specimens from the New Forest (Hampshire). As *H. solstitialis* is easily confused with *H. muehlfeldi* (amongst others), all other English records, from Cambridgeshire, Hereford and Worcester, Durham and a recent one from the New Forest, must be re-evaluated. Habitat unknown. Flight period late June to early July.

***Tabanus autumnalis* Linnaeus 4301**

A frequent species whose geographical range is similar to that of *T.*

bromius (Map 37); apart from an old and questionable record from Durham (Wingate 1906), it has not been recorded north of a line from the Wash to mid Wales. However, its precise distribution differs from that of *T. bromius* in being more confined to marshes, especially those of southern counties, although habitats include wet woodland and wet heathland. The larvae probably develop in wet mud. Flight period mid May to mid September, but mostly late June to mid July.

Tabanus bovinus Linnaeus 4302

There has been considerable confusion over the identity of this species; only males can be reliably named. The only specimen that is regarded as genuine *T. bovinus* was caught in the New Forest (Hampshire) in 1897, and all others in the Natural History Museum, London, and Hope Department, Oxford, labelled as *bovinus* are misidentified *T. sudeticus*. Unchecked records also come from Cornwall, Dorset, Oxfordshire, Hertfordshire, Kent, Essex and Gwynedd, although the bulk of the records come from the New Forest; these, too, might prove to be *sudeticus*.

Tabanus bromius Linnaeus 4303 **Map 37**

This species is recorded slightly more frequently than *T. autumnalis* and, as its habitat is usually woodland and adjacent damp meadows, it is less confined to the coast. Flight period early June to early September, peaking in early July.

Tabanus cordiger Meigen 4304

Scarce though widespread. The only recent records come from Trevassack (Cornwall), Dulverton (Somerset), New Forest area (Hampshire), Hafren Forest (Powys), Rhyd y Creuau (Gwynedd), Hamsterley Forest (Durham) and the Spey Valley (Highland). There are old records from many, mostly western, counties from Cornwall to the north of Highland. It is found mainly in woodlands. Flight period early June to late August, though mostly June.

Tabanus glaucopis Meigen 4305

Rare and almost restricted to the chalk downs in southern England. It has

been recently recorded in Hampshire where most of the old records also come from, and in Surrey and Buckinghamshire. Old records from Norfolk (1968) and Hereford and Worcester are dubious as the geology and habitat do not fit the species' requirements, which are thought to be for partly wooded or scrubby chalk downs. However, an old record from Cornwall came from the Lizard on base-rich serpentine rocks. Flight period mid June to late August, mostly early August.

Tabanus maculicornis Zetterstedt 4306

This is now an uncommon southern species which used to be more frequent, as indicated by old records from many counties south of a line from the Wash to the Mersey. Verrall (1909) quoted a record from Rannoch. Recent records come from Powys, Devon, Dorset, Hampshire and Surrey. The overall distribution resembles that of *T. bromius* (Map 37). Adults occur mostly in woodlands. Flight period mid May to mid July, rarely into early September, and with a strong peak in late June.

Tabanus miki Brauer 4307

This species closely resembles *T. bromius*. Only authenticated specimens in the Natural History Museum, London, which are all from the New Forest (Hampshire), are currently accepted as genuine. A male collected in Norfolk in 1968 has recently been confirmed as genuinely of this species (Durrant 1990). However, unchecked recent records come from the Isle of Wight, Hampshire, Kent and South Yorkshire. Old records from Warkwickshire and Dorset are probably misidentifications. Flight period July to early August.

Tabanus sudeticus Zeller 4308 **Map 38**

This is a strongly western and northern species of upland acid areas, but with lowland populations mainly on the heaths and bogs of Hampshire and Surrey. Flight period mid June to mid September, frequent throughout July.

Tabanus spodopterus Meigen

Recently recognised from a single specimen from Porthleven (Cornwall),

1929, but this may be a mislabelled continental specimen (J Chainey, pers.comm.).

ASILIDAE

Asilus crabroniformis Linnaeus 201 — Map 39

Being instantly recognisable even to non-dipterists, this fly is undoubtedly better recorded than most and therefore its distribution map is probably one of the most accurate. Nevertheless, it is scarce these days owing to the continuing loss of its habitats that include heaths, dunes and chalk downs, and it is apparently extinct in East Anglia. Flight period late July to early October and most frequent throughout August, but there are records from the end of June.

Dioctria atricapilla Meigen 1301 — Map 40

Found mainly on dry grasslands and heaths, less frequently in damp grassland or woodland edge habitats. Flight period mid May to late July, rarely to mid August, most frequent from early June to early July.

Dioctria baumhaueri Meigen 1302

A frequently recorded asilid with an English distribution very similar to that of *D. atricapilla* (Map 40), though especially frequent in the south-east from Norfolk to Hampshire. So far, only one Welsh record, from Gwent. It is a woodland edge species. Flight period mid May to late August, peaking from late June to mid July. There is one record for early April.

Dioctria cothurnata Meigen 1303

Rare and probably declining, although widespread in Britain. There are only five recent records: mid Wales, Gwent, Dorset, Somerset and North Yorkshire. Old records come from Essex, Surrey, Hampshire (New Forest in 1969), Oxfordshire, Gloucestershire, Hereford and Worcester, and Highland. The adults may be associated with woodland edge habitats. Flight period mid May to early August, peaking in mid July.

Dioctria linearis (Fabricius) 1304 **Map 41**

This species has a southern distribution similar to that of *D. baumhaueri* and *D. atricapilla*, but is virtually absent from the low-lying land of the eastern counties from Lincolnshire to Essex, where *D. baumhaueri* is frequently found. It is slightly less common than these other two species. Adults are mostly recorded from woods and their margins. Flight period late May to mid August, peaking in late June to early July.

Dioctria oelandica (Linnaeus) 1305

Scarce but scattered throughout Britain in ancient oak (*Quercus* spp.) woodlands. Recent records come from the southern counties, Norfolk, Welsh borders, northern England and central Scotland; old records additionally covered the southern Midlands and East Anglia. It appears to have undergone a decline inland. Flight period mid May to early July, rarely to late August, most frequent in early to mid June.

Dioctria rufipes (Degeer) 1306 **Map 42**

The commonest asilid. It is found in many habitats, especially woodland edge and scrub, but is virtually absent from upland areas. Flight period mid May to mid August, peaking in early to late June.

Dysmachus trigonus (Meigen) 1401 **Map 43**

Found mainly on sparsely vegetated, sandy soils of heaths and dunes. In the north of its range, it is almost confined to the milder coastal belt (the inland record from Cumbria may be a misidentification). Flight period mid May to late August, peaking in late June to early July.

Epitriptus arthriticus (Zeller) 1501

A very rare species (RDB1) known only from four specimens, three from the Norfolk Breckland (1907-49) and one from Berrow (Somerset, 1955), both sandy localities. Flight period early June to mid August.

Epitriptus cingulatus (Fabricius) 1502

Other than on the sandy heaths of Dorset, Hampshire, Isle of Wight and the Breckland of Suffolk and Norfolk, this species is very uncommon, and mostly found in isolated coastal colonies as far north as the Moray Firth; its distribution resembles that of *Dysmachus* (Map 43). It is usually found in woodland edges on sandy heaths. Flight period mid July to mid September (three early records from late May and June), commonly from late July to early September.

Epitriptus cowini Hobby 1503

This rare species (RDB2) has an unusual distribution 'centred' on the Irish Sea, being found on the Isle of Man, Harlech (Gwynedd) and on the east and south coasts of Ireland, mostly on dunes. Flight period late June to late August.

Eutolmus rufibarbis (Meigen) 1601 **Map 44**

The distribution pattern of this species is shared by a few other scarce species that are also almost confined to the broken band of sandy heaths from Dorset to the Breckland in Norfolk. It is classed as RDB1. Flight period late June to mid September, peaking strongly in early August. There is one record for early June.

Laphria flava (Linnaeus) 1901

A rare Scottish species (RDB3). There are recent records in the area between the Spey valley and the Moray Firth (Highland, Grampian), and many old records from the Spey valley area and further east in Grampian. The adults are found in ancient pine woods and the larvae live in beetle burrows in dead pine (*Pinus sylvestris*). Flight period late May to early August, peaking in early July.

Laphria gilva (Linnaeus) 1902

Verrall (1909) mentioned this as a reputed British species, and it has been positively identified only five times between 1938 and 1951 from the pine

(*Pinus* spp.) woods of Surrey and Berkshire. It is classed as RDB1. Flight period mid June to late July, and one record for mid September.

***Laphria marginata* (Linnaeus) 1903** **Map 45**

An uncommon species found predominantly in ancient woodlands. About half of the records come from Hampshire and Surrey. Flight period mid May to early September, mostly late June to mid July with a second peak in mid August, possibly an artefact of the small sample.

***Lasiopogon cinctus* (Fabricius) 2001**

Uncommon and scattered through England and Wales as far north as Cumbria, though it is more frequently found in the south, especially in Hampshire, West Sussex and Surrey. Other recent records come from Suffolk, Norfolk, Shropshire, Dyfed (needs checking), Merseyside, Nottinghamshire, South Yorkshire and Cumbria. Adults are found on sandy heaths and dunes, usually near trees. Flight period early May to early August, with no obvious peak in abundance, but scarce after June.

***Leptarthrus brevirostris* (Meigen) 2101** **Map 46**

Although this is one of the more frequently recorded asilids, it has a patchy distribution as a result of its unusual habitat requirements. In southern England, it is almost confined to calcareous grassland, but further north and in the west it may be found on other, usually base-rich, soils where it is more often associated with woodlands. The larval biology is unknown. Flight period early May to early September, most frequent in June.

***Leptogaster cylindrica* (Degeer) 2201** **Map 47**

A frequent asilid in long grassland in southern England, but scarce north of the Midlands. Flight period late May to mid August, peaking from late June to mid July.

***Leptogaster guttiventris* Zetterstedt 2202** **Map 48**

Much scarcer than *L. cylindrica*, but more widely distributed, being the only

one of the two species in the genus to occur in Scotland. Adults are usually found in dry grassland. Flight period early June to early September, peaking in July.

Machimus atricapillus (Fallén) 2301 **Map 49**

One of the commoner asilids in the south and east of England. Adults are found mostly in open, dry habitats such as grasslands, heaths and dunes, but they also occur in open woodlands. Flight period early June to mid October, common from late July to late August, and frequent well into September.

Machimus rusticus (Meigen) 2302

Rare (RDB2) and scattered across southern England from Northamptonshire to the Isle of Wight, including East Sussex, Hampshire, Wiltshire, Oxfordshire, Berkshire and Avon, and with old Kentish records. All the reliably identified specimens have been found on calcareous grassland. Flight period early June to mid August, mostly July and August.

Neoitamus cothurnatus (Meigen) 2601

Probably extinct and classed as RDB1: the only records are from two woods near Oxford, where the species was taken between 1895 and 1921.

Neoitamus cyanurus (Loew) 2602 **Map 50**

Adults are associated with ancient woodland, especially oak (*Quercus* spp.) woods. Flight period late May to early October, most frequent from mid June to mid July.

Pamponerus germanicus (Linnaeus) 3101 **Map 51**

An uncommon species restricted to coastal sand dunes. Flight period mid May to early August, peaking in early to mid June.

Philonicus albiceps (Meigen) 3201 **Map 52**

A frequent asilid of coastal dunes (the inland Kentish record is doubtful). Flight period early June to late September, frequent in June and August.

Rhadiurgus variabilis (Zetterstedt) 3601 **Map 53**

A local Scottish species found on river banks. Most records are from the Spey valley. Flight period early June to early August, mainly mid June to mid July.

THEREVIDAE

Dialineura anilis (Linnaeus) 1201

A scarce species restricted to a few coastal dune systems, mainly in Wales (Mid and West Glamorgan, Dyfed, Gwynedd, Anglesey) where it is locally frequent, and also in Merseyside and north-west Highland. There are old records from Somerset and Cork in Ireland. *Pamponerus germanicus* has a similar distribution. Flight period early May to mid July (one record for late August), most frequent in late June to early July.

Psilocephala melaleuca (Loew) 3401

All but one of the records of this very rare species (RDB1) are from Windsor Forest or nearby (Berkshire), the exception being a recently reared larva from Greenwich Park (Greater London). The larvae, which are easier to find than adults, have been found in decaying oak (*Quercus* spp.), beech (*Fagus sylvatica*) and ash (*Fraxinus excelsior*) in these ancient woodlands. Flight period May to early July.

Psilocephala rustica (Panzer) 3402

A rare but widely distributed species (RDB3) in England and Wales, found by lowland sections of stony rivers where sandy banks are partially shaded. Recent sightings come from the Rivers Rother (west Suffolk), Usk (Gwent), Monnow (Hereford and Worcester), Irthing (Cumbria) and Rye

(North Yorkshire); older records come from the Rivers Etherow (1962) and Bollin (Cheshire). Larvae have been collected from a river shingle bank. Flight period late May to mid August.

Thereva annulata Fabricius 4401 **Map 54**

A frequent species of coastal dune systems and very rarely found on sandy localities inland, such as the Breckland (Norfolk, Suffolk) and a common in Hereford and Worcester. Flight period mid May to late August, but apparently with two peaks, a broad one in June to early July and a smaller one, mainly from east coast records, in late July to mid August. Whilst this may be an artefact of the small sample size, it would be worth investigating whether two species have been confused.

Thereva bipunctata Meigen 4402

Uncommon and less frequently recorded than *T. annulata*, but similarly distributed in coastal dune systems of the Moray Firth (Highland, Grampian), Cumbria, Dyfed, Mid Glamorgan, Somerset, Dorset to East Sussex and Norfolk (recent records), and from Suffolk, Cornwall, Gwynedd, Lancashire, and Sutherland (Highland) (old records). It occurs inland on heathland in the Breck (Norfolk, Suffolk) and north Lincolnshire, and was recorded until the late 1960s at a number of heaths in Surrey, Greater London and Hertfordshire. In Ireland, there are recent and old records from counties Dublin and Wicklow, respectively. Flight period late May to early September, peaking in mid July to early August, though also frequent in June.

Thereva fulva (Meigen) 4403

A rare southern species recorded recently from coastal sites in Mid and West Glamorgan, Pembrey Burrows (Dyfed), Sandwich (Kent) and two inland sites in Surrey and Hampshire. There are several old records from the Thames Estuary (Kent). Flight period early May (exceptional) to mid August, though mostly in mid June to mid July.

Thereva handlirschi Krober 4404

A rare species (RDB3) recorded only in Highland and Grampian in the Spey

valley and the Moray Firth area, last seen in 1946. Flight period early July to early September, mostly July to early August.

Thereva inornata Verrall 4405

Like *T. handlirschi*, this is a rare species (RDB3) restricted to the Scottish uplands, mainly around the Spey valley (Highland, Grampian), and was last seen in 1946, apart from a recent record from Inver on the River Dee. Flight period mid June to early September, mainly July.

Thereva lunulata Zetterstedt 4406

Rare (RDB3) but, if the records are reliable, widely distributed in Britain, with a pronounced cluster in the Spey valley area and Easter Ross (Highland, Grampian). There are isolated recent records that need checking from Anglesey, Northamptonshire and Essex, and old records from Powys, Hereford and Worcester and Northumberland. Recently it has been reliably reported from Dyfed. It is mostly found on stream and river shingles with sand and sparse vegetation. Flight period late May to mid August, mostly mid and late June, and a single record in early April.

Thereva nobilitata (Fabricius) 4407 **Map 55**

The commonest therevid, but still rather local. Adults are usually found in scrubby habitats, hedgerows, tall grassland and dry heaths. Flight period late May to early September, most frequent from late June to late July.

Thereva plebeja (Linnaeus) 4408 **Map 56**

This species has been mapped to illustrate its serious recent decline in status. It is found in similar habitats to *T. nobilitata*. Flight period late April (exceptional) to late August, mainly mid May to early July, peaking in June.

Thereva strigata Fabricius 4409

Rare (RDB3) and known from only four records from southern coastal cliffs,

Torquay (Devon), two from the Isle of Wight, and Shakespeare Cliff (Kent), the last being a recent record. Flight period late May to July.

Thereva valida Loew 4410

A rare Scottish species (RDB3) known from two recent records from Tayside and from a few old records from the Spey valley (Highland, Grampian). Flight period early June to mid July.

SCENOPINIDAE

Scenopinus fenestralis (Linnaeus) 3901 Map 57

Uncommon. As homes become more synthetic, mills more hygienic, and stables disappear, these traditional habitats may support fewer fleas and clothes moths, its larval food, than previously. Flight period late April to late August (one October record), most frequent from late June to mid July.

Scenopinus glabrifrons Meigen 3902

Known only from the single specimen mentioned by Oldroyd (1969), from London, 1931.

Scenopinus niger (Degeer) 3903

Rare, with only four recent records from Denbighshire (Clwyd), Hartford and Wimpole (Cambridgeshire), and Windsor Great Park (Berkshire) where a puparium was found under oak bark. Old records come from Devon, Hereford and Worcester, Avon, Hampshire, Buckinghamshire, Surrey, Suffolk, and an outlier from Grampian (1904); also from Co. Down in Ireland. Flight period late May to early July, exceptionally late August, most frequent in June.

ACROCERIDAE

Acrocera orbicula Fabricius 101

Uncommon and found mainly in several south-eastern counties from Norfolk to Dorset, but also recently in Powys, Humberside, North Yorkshire and Cumbria. Old records are from the Yorkshire Dales, the Welsh borders and Cheshire Plain. Adults are usually found in dry grassland or similar dry habitats, but also from fens and bogs. Flight period early May (exceptional) to early September, peaking in late July to mid August.

Ogcodes gibbosus (Linnaeus) 2801 **Map 58**

A rare southern species found recently in fens, heathland and chalk grassland. Flight period mid June to late August, peaking late June to mid July.

Ogcodes pallipes Latreille 2802

Rare and probably declining. There are only four recent records, from Ruislip Wood (Greater London), Epping Forest (Essex), Cavenham Heath (Suffolk) and Mitcham Common (Surrey). Previously, it was widespread in southern England south of a line from the Wash to the Mersey, including Mid Glamorgan. There is one old record from North Yorkshire. There are more records from the eastern half of England than the west, contrary to Oldroyd's (1969) assertion that it is mostly a western species. Flight period late May to mid August, though nearly all captures are in July.

BOMBYLIIDAE

Bombylius canescens Mikan 701 **Map 59**

This scarce species has a disjunct distribution that shows an unusually strong south-westerly bias in the southern part of its range, a feature shared by few other larger brachycerans. Several records come from calcareous hillsides, but it may not be confined to this habitat as in parts of

Dyfed it occurs on heathy banks beside mires. Flight period mid May to mid August, peaking mid June to early July.

Bombylius discolor Mikan 702 — Map 60

Uncommon and declining though still widely recorded. It is especially frequent in Dorset and north Kent. Its habitats are similar to those of *B. major*. Flight period late March to mid June, but mostly in mid to late April.

Bombylius major Linnaeus 703 — Map 61

A common species in England, but probably genuinely scarce in Ireland. Adults are found in sheltered woodland edge habitats, hedgerows, etc. Flight period mid March to late June (one record for late July), but frequent throughout mid April to late May.

Bombylius minor Linnaeus 704

A rare species with a stronghold on the east Dorset heaths (though rarely recorded here recently), extending to the New Forest. Old records from Surrey and south Devon may also relate to heathland. Older records which need verifying are from the coasts of the Isle of Man (1964), and Gwynedd. Flight period mid June to early September, peaking in early August.

Phthiria pulicaria (Mikan) 3301

An uncommon, though locally frequent, species of coastal dunes around the whole coast. Its distribution is a sparser version of that of *Thereva annulata* (Map 54). There is one old record for Dublin, Ireland. Flight period late May to mid August, peaking in late June to early July.

Thyridanthrax fenestratus (Fallén) 4501 — Map 62

This map is probably an accurate portrayal of the distribution of this rare (RDB3) and distinctive species of sandy heaths where its larvae parasitise

Ammophila sabulosa wasps. Flight period late May to early September, with a peak in late July.

Villa cingulata (Meigen) 4701

Rare (RDB2), and not seen since 1938, though old records come from a number of southern counties: Cornwall, Devon, Hereford and Worcester, Oxfordshire, Hampshire and Kent. Its habitat apparently includes sheltered downland and woodland edge. Flight period early June to mid August.

Villa circumdata (Meigen) 4702

A rare species (RDB2) of sandy heaths, not seen since 1958. There are few old records, mostly from the Dorset heaths, and isolated ones from the New Forest (Hampshire) and Surrey, whilst dubious records are from the Isle of Wight, Cornwall and Gwynedd. Flight period mid July to late August, mostly late August.

Villa modesta (Meigen) 4703

An uncommon species of coastal dunes around the whole coast up to the Firth of Tay; its distribution is a sparse version of that of *Thereva annulata* (Map 54). Recent records are from Cornwall, Isle of Wight, Norfolk, Cumbria, Isle of Man, Mid Glamorgan, Dyfed, Lothian and Tayside. Old records add Devon and Gwynedd. Inland records are a sighting from Kent and from a sandy heath in Suffolk, mentioned by Verrall. There are several old records from the south-east coast of Ireland. A taxonomic review is needed because more than one species may be included under *modesta*. Flight period early June to early September, with no pronounced peak.

Species richness **Map 63**

The map shows the number of species recorded in each 10-km square of the British and Irish National Grids based on the data in the Biological Records Centre data base.

ACKNOWLEDGEMENTS

I am grateful to the many recorders whose contributions have culminated in this *Atlas*, and to the curators who made available or contributed records from the collections in the museums listed below. I would like to thank the staff of the Biological Records Centre at Monks Wood for their help in producing the *Atlas*, especially Brian Eversham for suggestions and corrections to the manuscript, for his careful checking of the records, and for his patience with a far-from-perfect set of record cards. Alan E Stubbs deserves my special thanks for his advice and encouragement, and also Dr Tony Irwin, who set up the Larger Brachycera Recording Scheme and who provided me with the opportunity to write this publication.

Museums and collections

Birmingham Museum and Art Gallery
Booth Museum of Natural History, Brighton
British Entomological and Natural History Society collections
Doncaster Museum and Art Gallery
Hancock Museum, Newcastle upon Tyne
Herbert Art Gallery and Museum, Coventry
John Spedan Lewis Trust collections, Leckford, Hampshire
Leicestershire Museum and Art Gallery, Leicester
Liverpool Museum (National Museums and Galleries on Merseyside)
Ludlow Museum
Manchester Museum
Manx Museum and Art Gallery, Douglas, Isle of Man
National Museum of Ireland, Dublin
National Museum of Wales, Cardiff
Natural History Museum, London
Norwich Castle Museum
Passmore Edwards Museum, London
Royal Horticultural Society Gardens insect collections, Wisley
Royal Museum of Scotland, Edinburgh
Sheffield City Museum
Smithsonian Institute, Washington, USA
Ulster Museum, Belfast
University College, Cork, Zoology Department collections
University Museum (Hope Department), Oxford
University Museum of Zoology, Cambridge

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DISTRIBUTION MAPS OF SELECTED SPECIES

Captions to maps

Map 1

● All records

Maps 2-16
18-62

● Recorded from 1970 onwards

○ Recorded before 1970 only

Map 17

■ Recorded from 1980 onwards

● Recorded between 1970 and 1979 inclusive

○ Recorded before 1970 only

Map 63

Number of species recorded in each 10 km square

● 21 or more species

○ 11 to 20 species

● 6 to 10 species

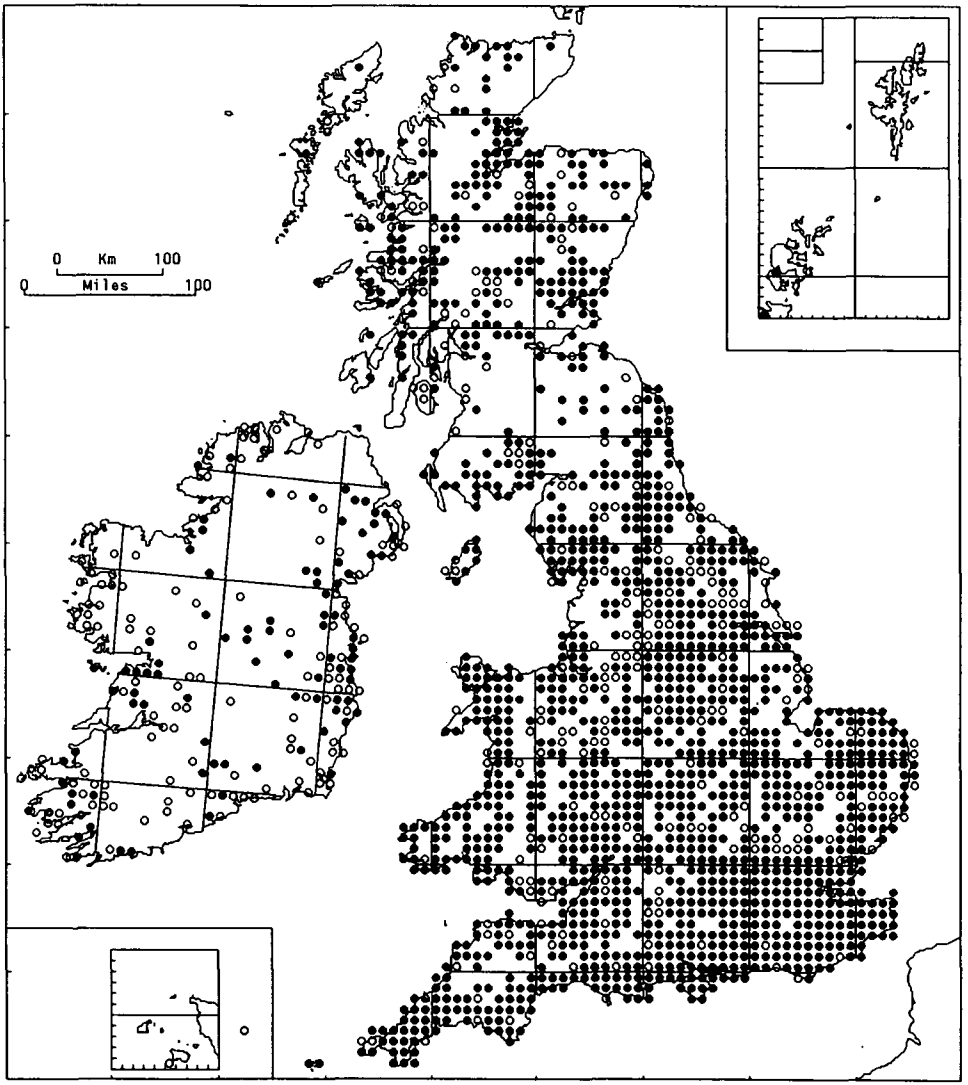
○ 2 to 5 species

• 1 species only

LARGER BRACHYCERA

Map 1

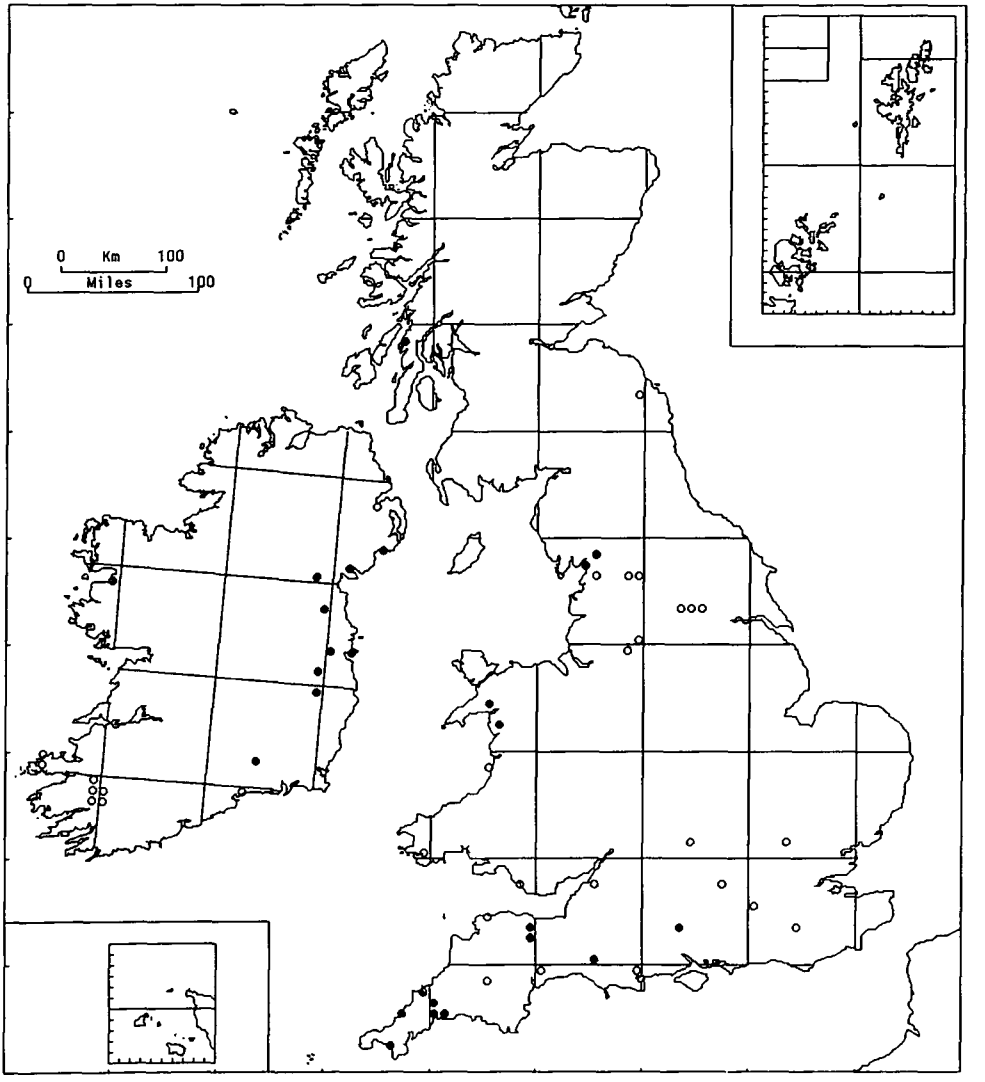
Coverage per 10 km square



Beris fuscipes

Map 2

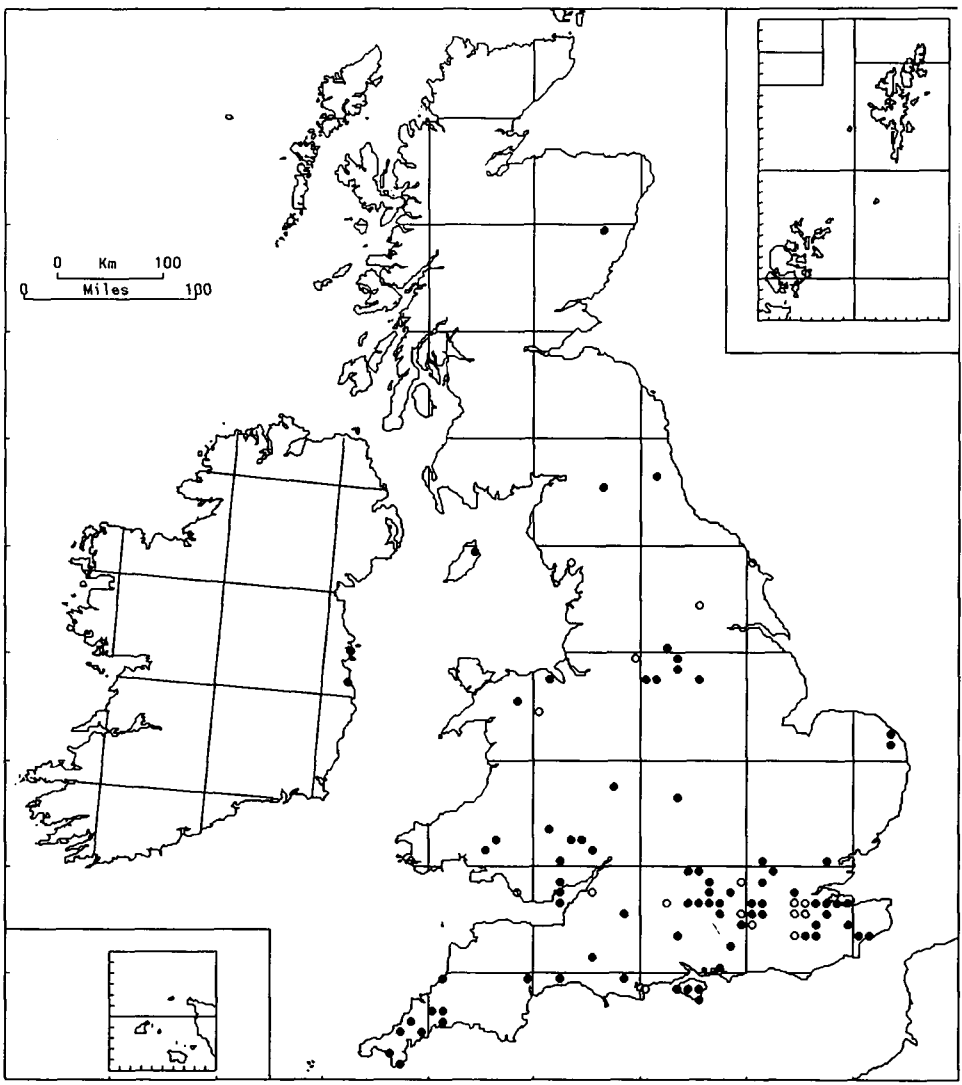
(Text on page 12)



Beris morrisii

Map 3

(Text on page 13)



Beris vallata

Map 4

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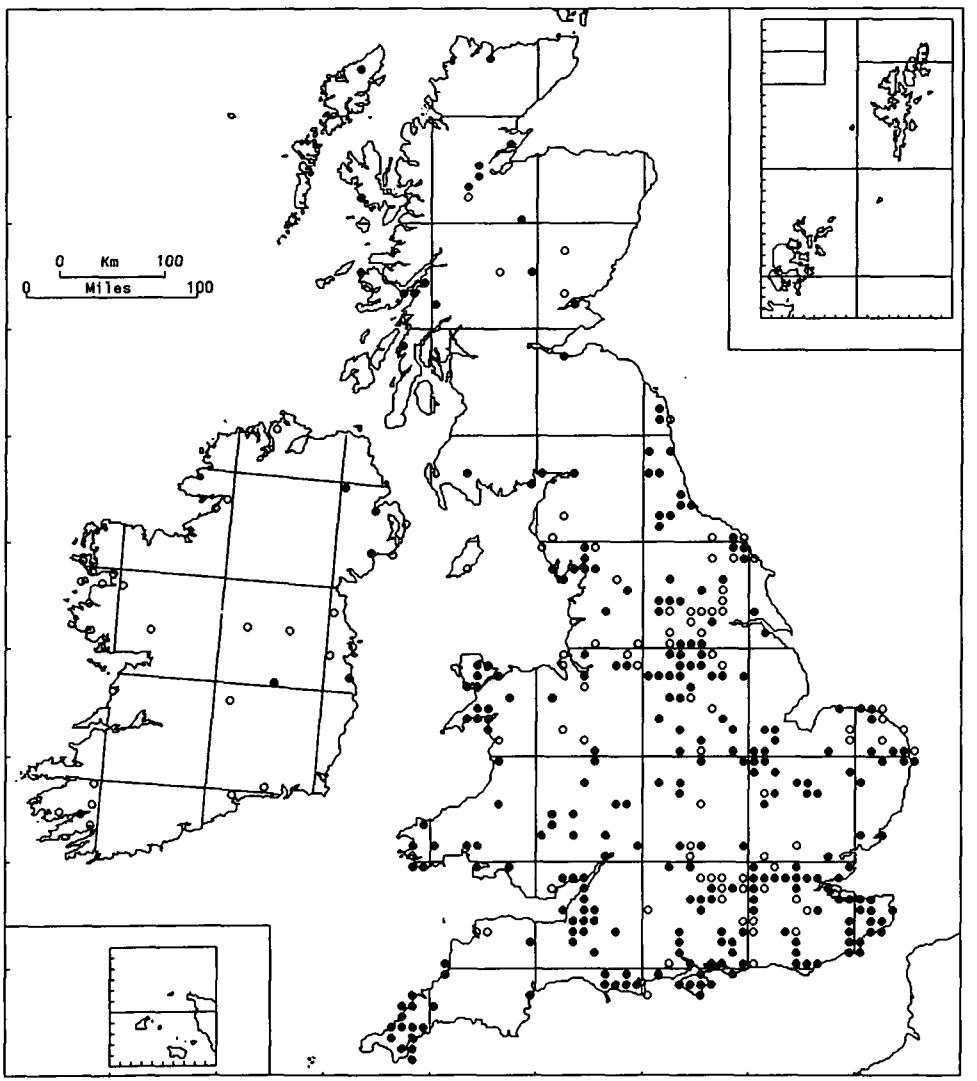

Chloromyia formosa

Map 5

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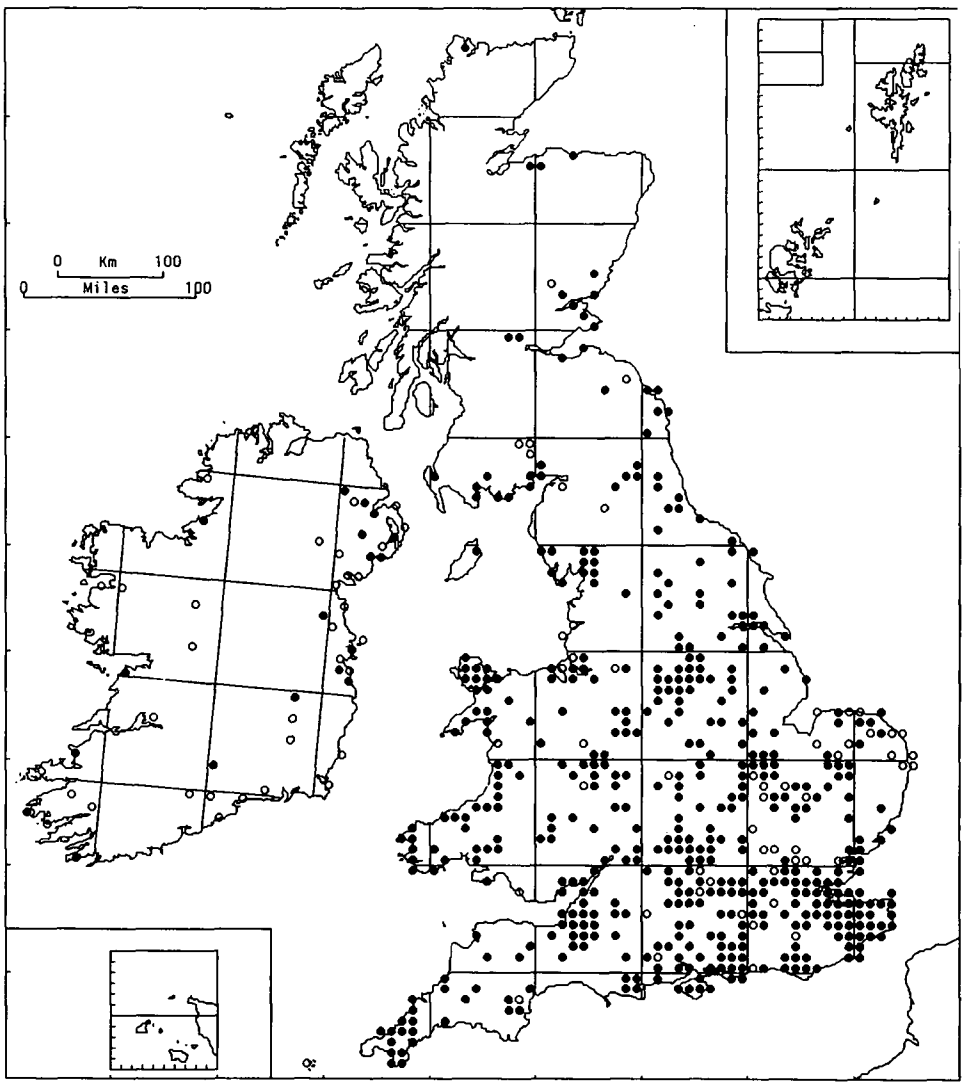

Chorisops nagatomii

Map 6

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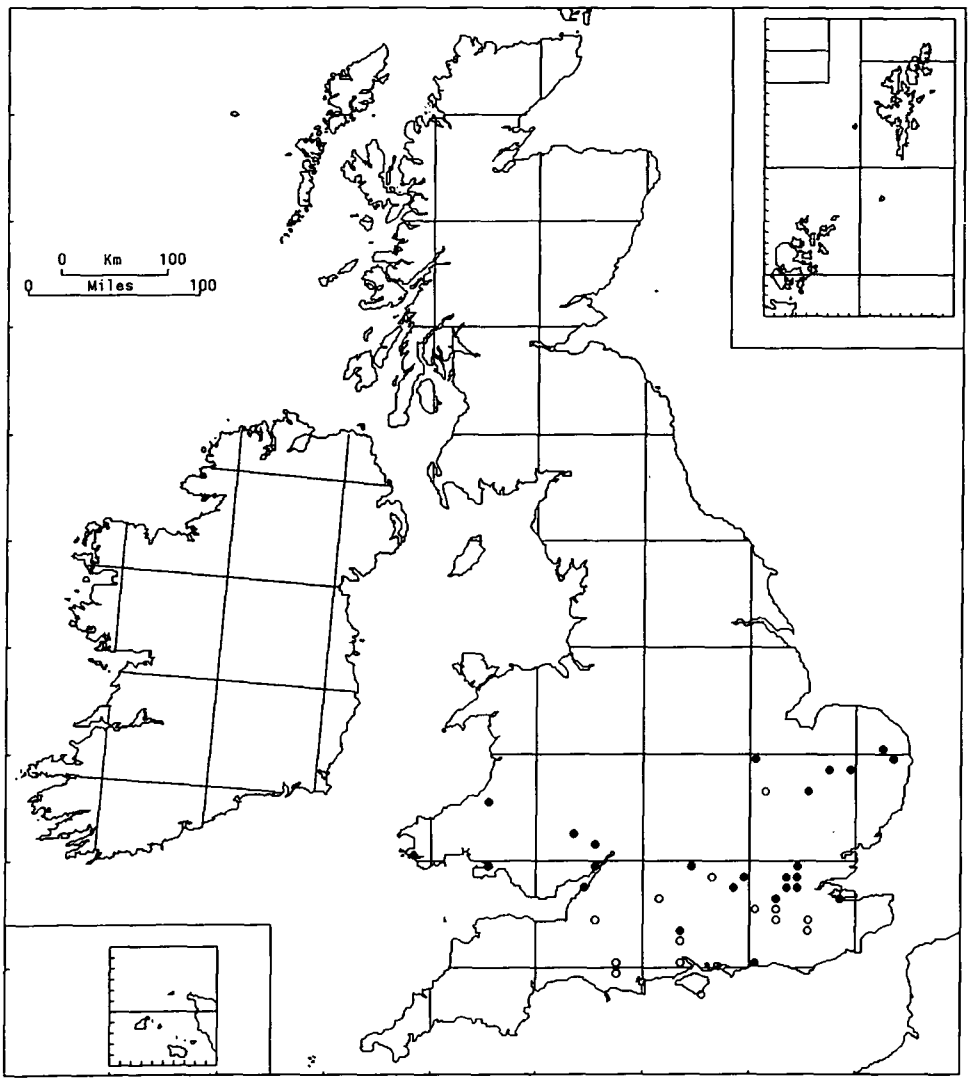

Microchrysa cyaneiventris

Map 7

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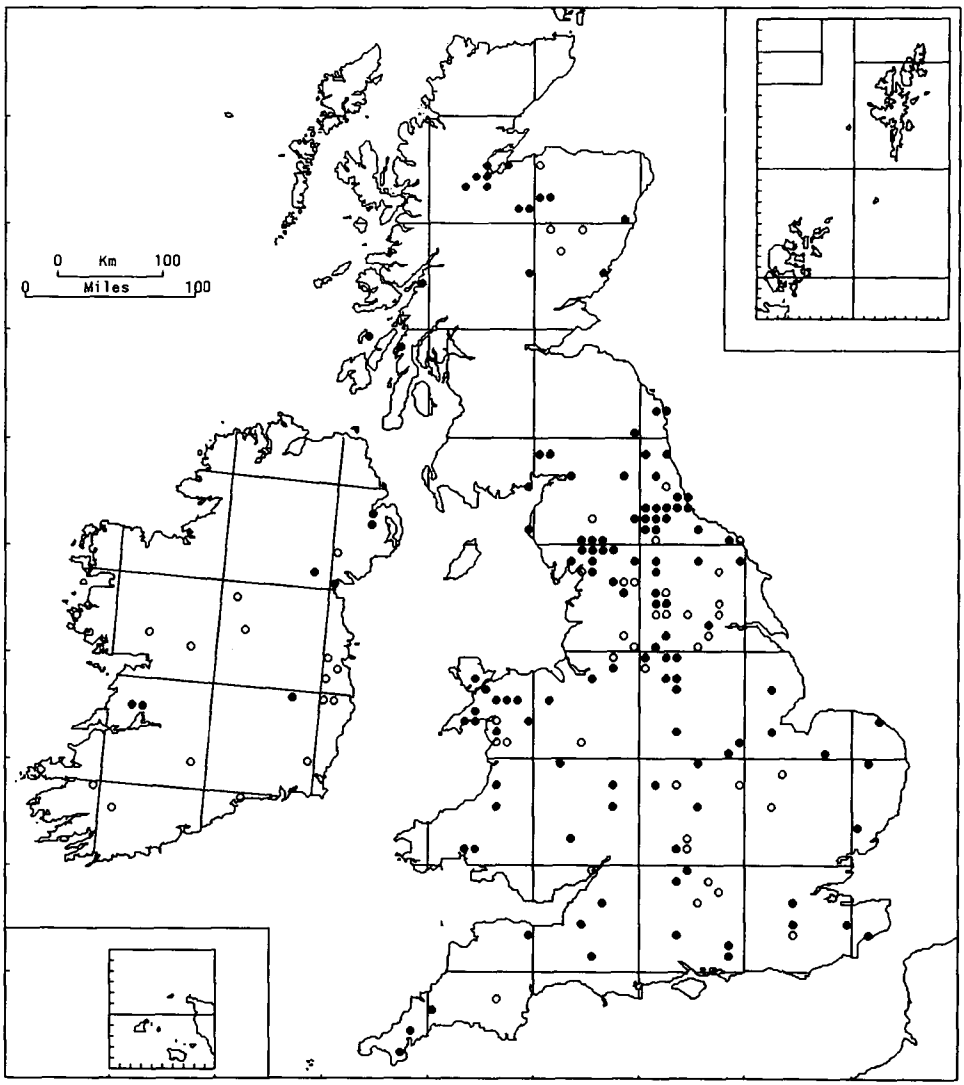

Nemotelus pantherinus

Map 8

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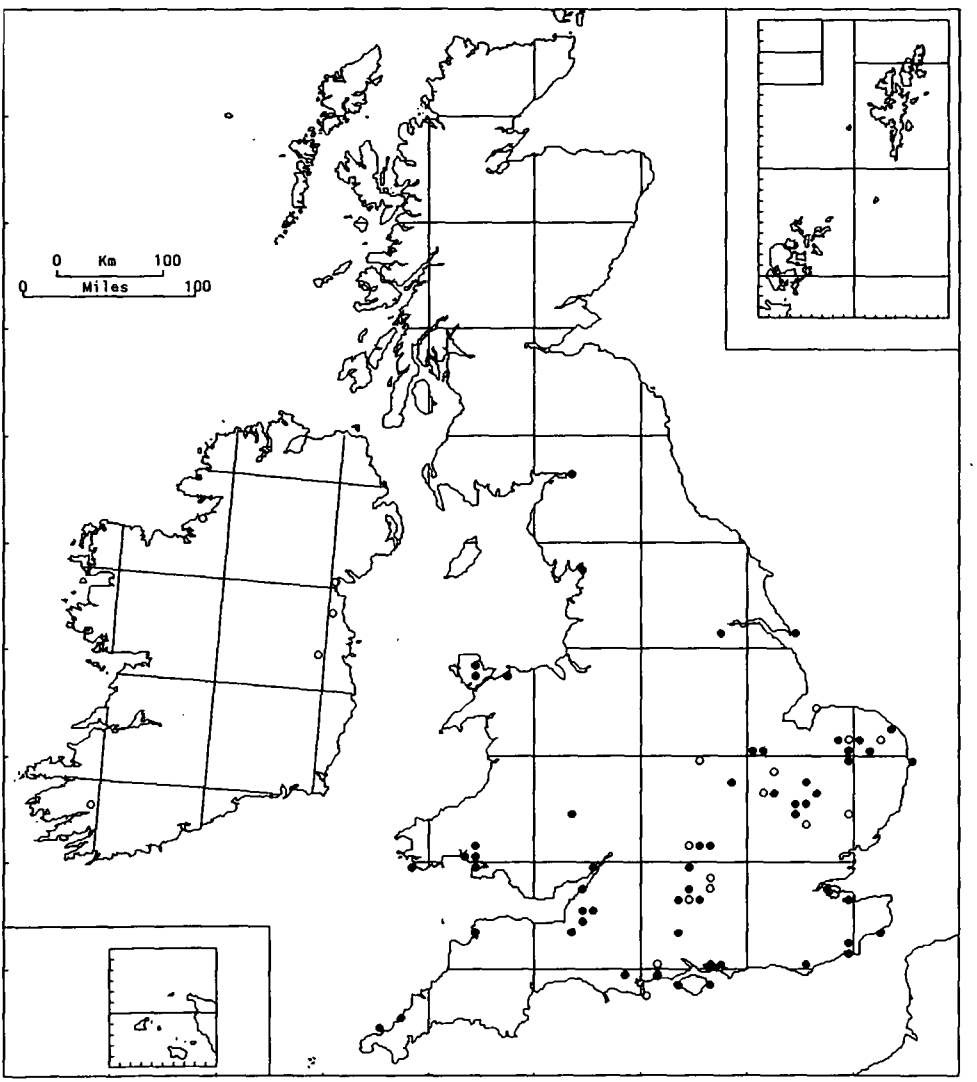

Nemotelus uliginosus

Map 9

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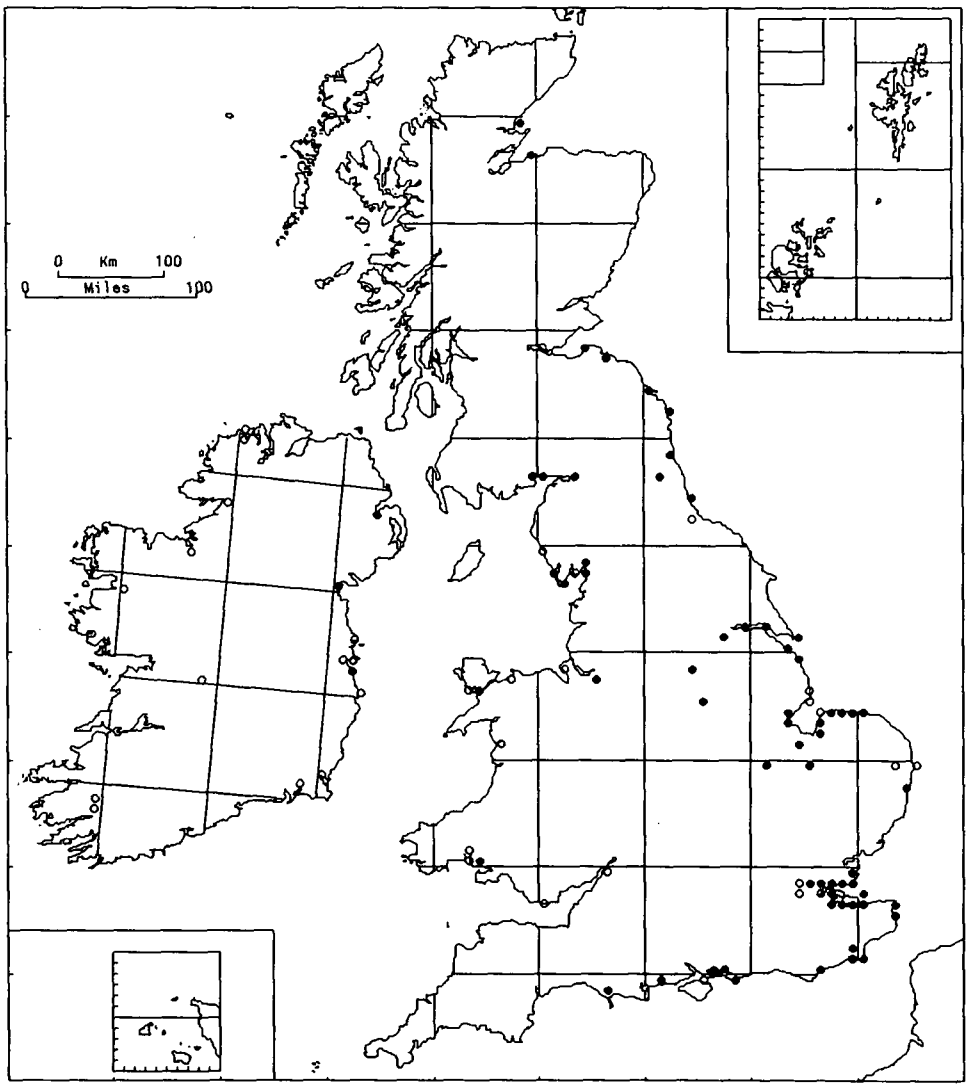

Odontomyia ornata

Map 10

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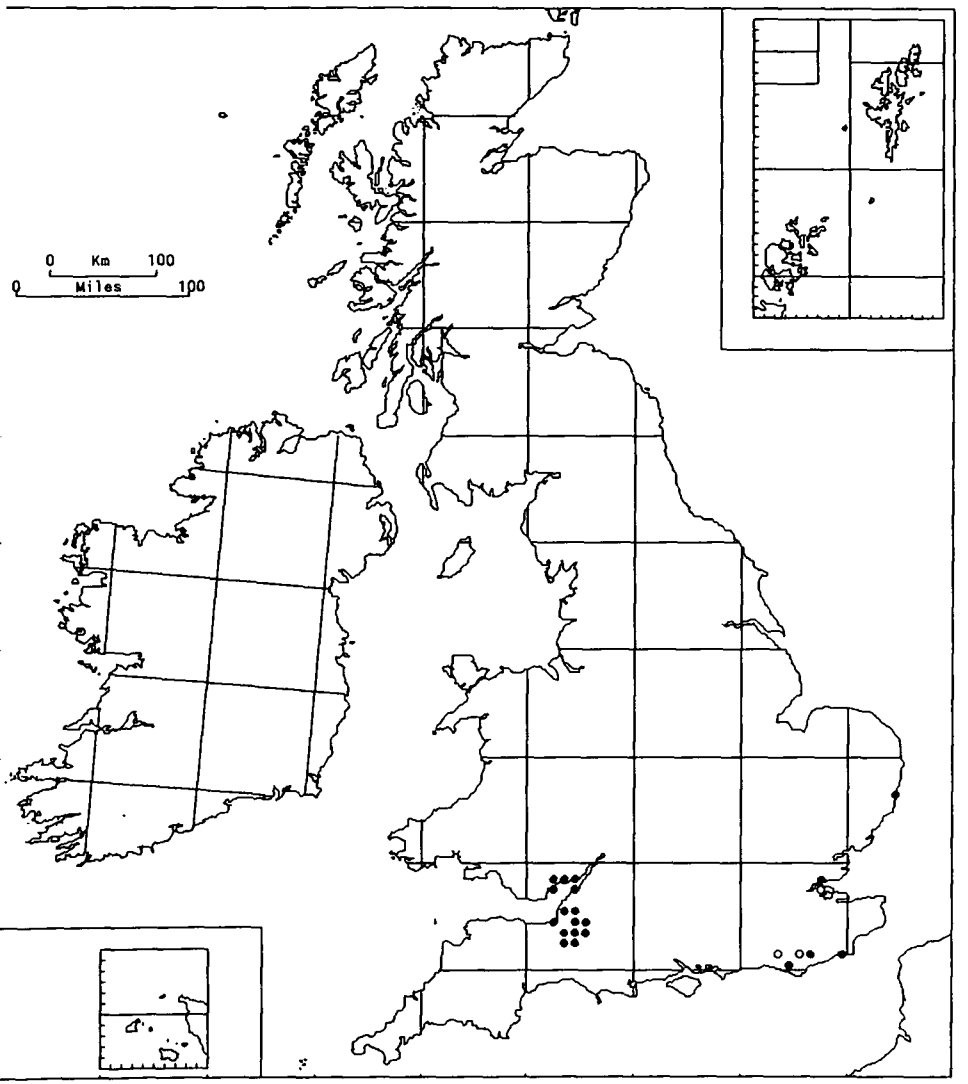
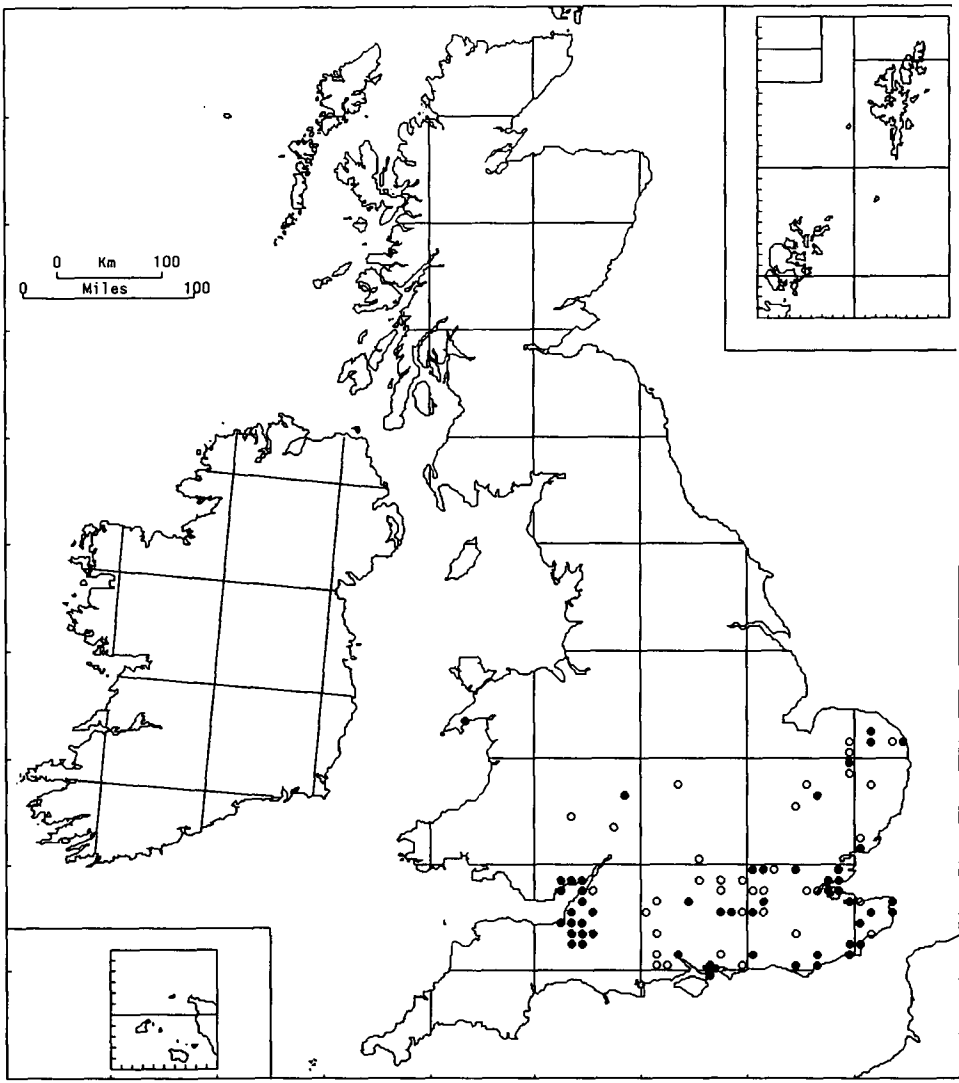


Odontomyia tigrina

Map 11

(Text on page 17)



Oplodontha viridula

Map 12

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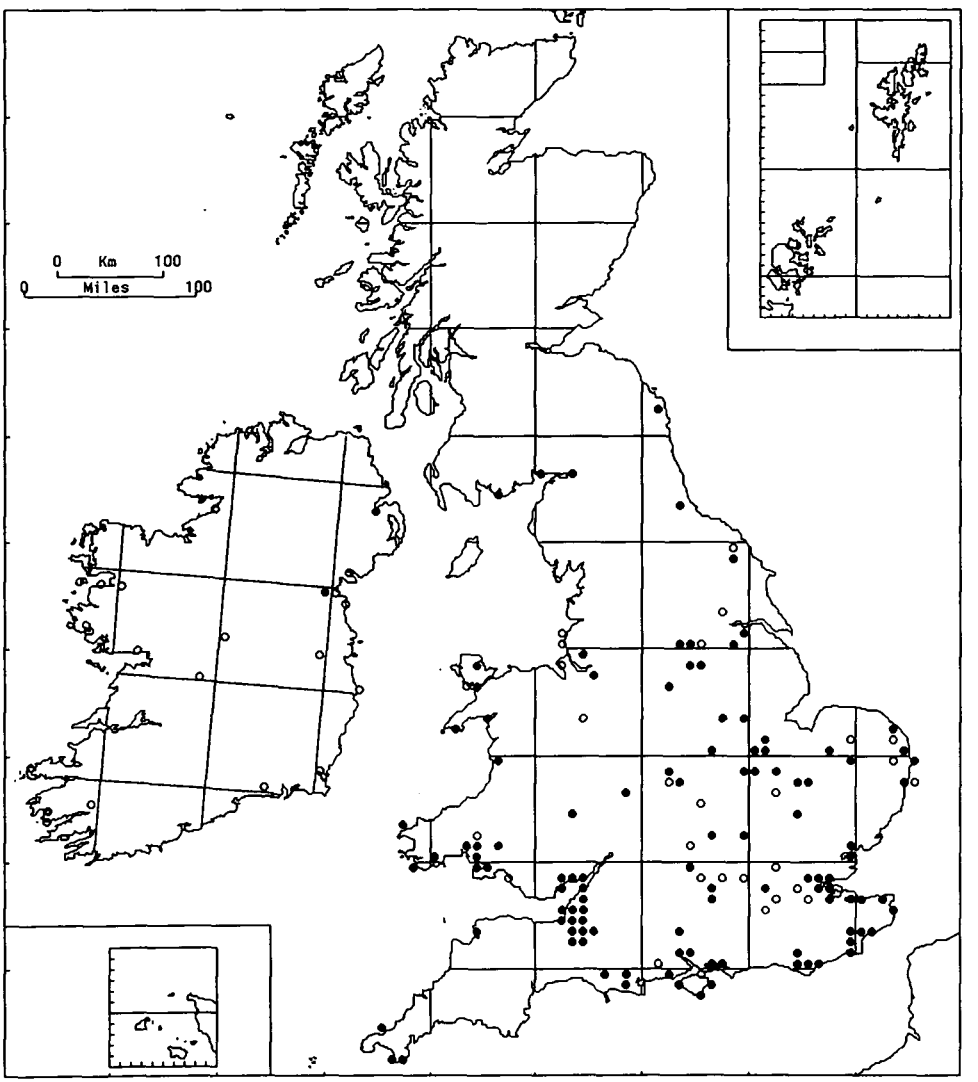

Oxycera pygmaea

Map 13

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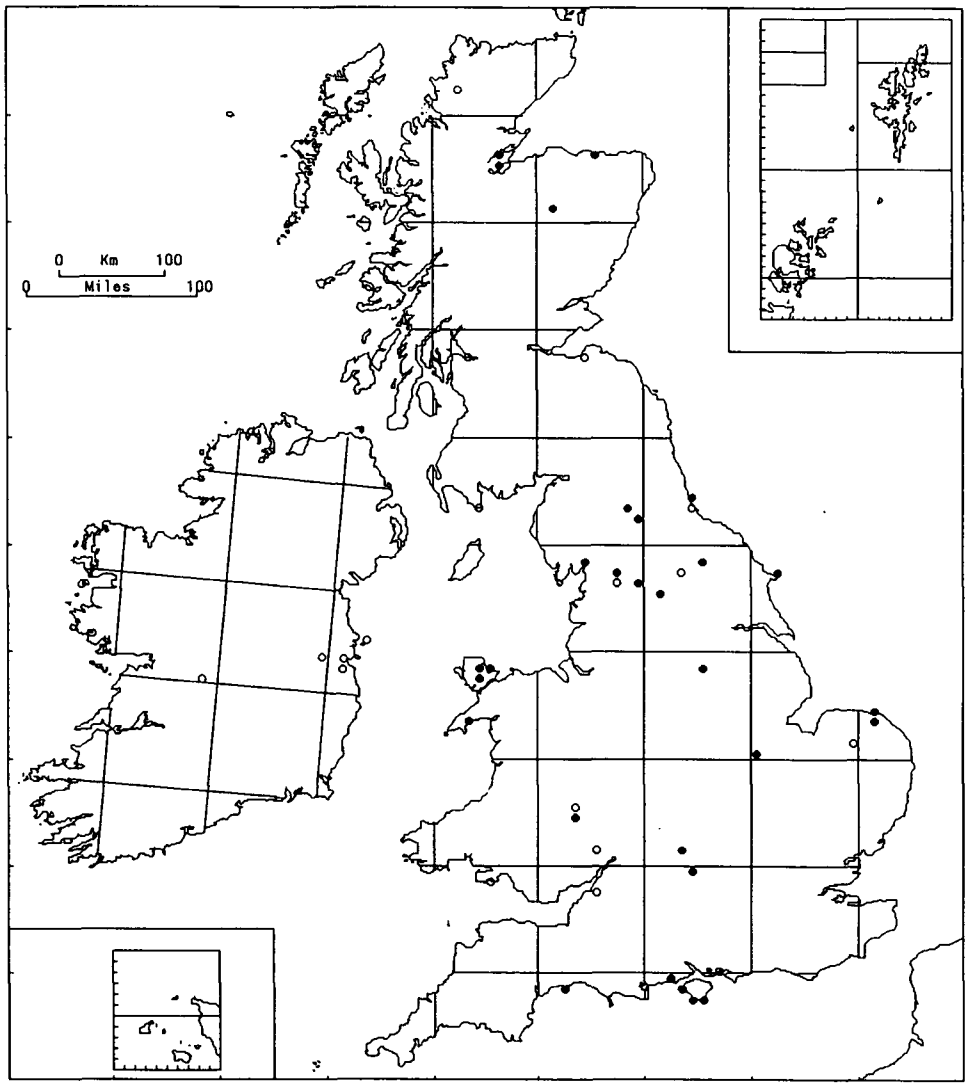

Oxycera rara

Map 14

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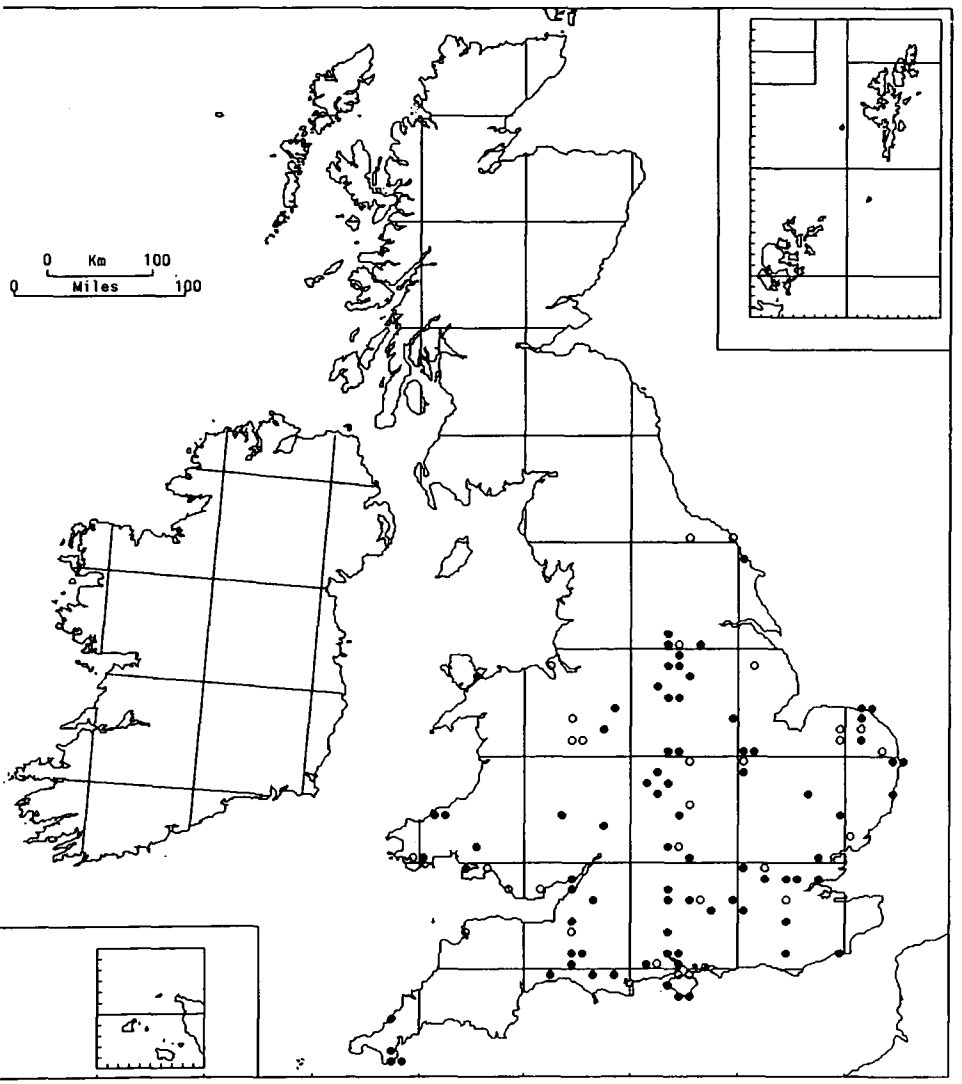

Pachygaster atra

Map 15

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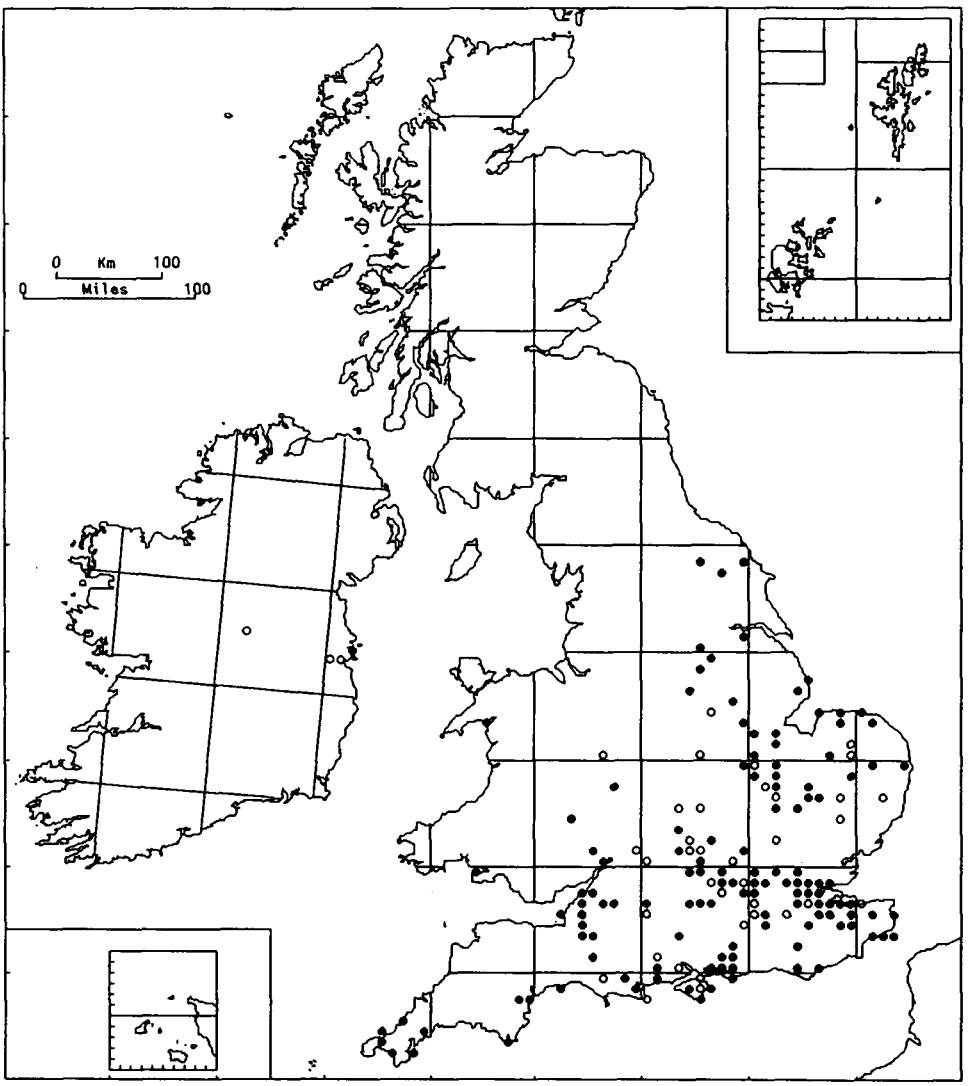

Stratiomys longicornis

Map 16

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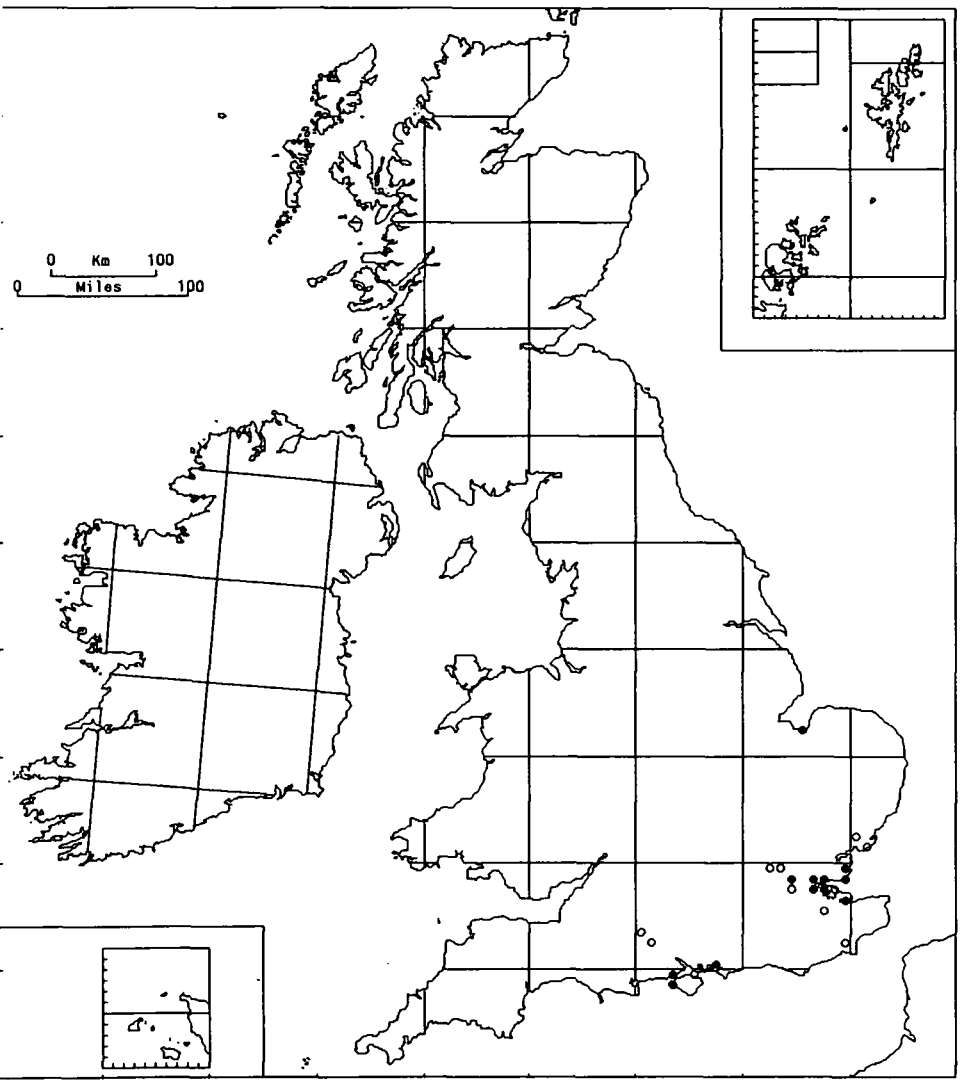

Stratiomys potamida

Map 17

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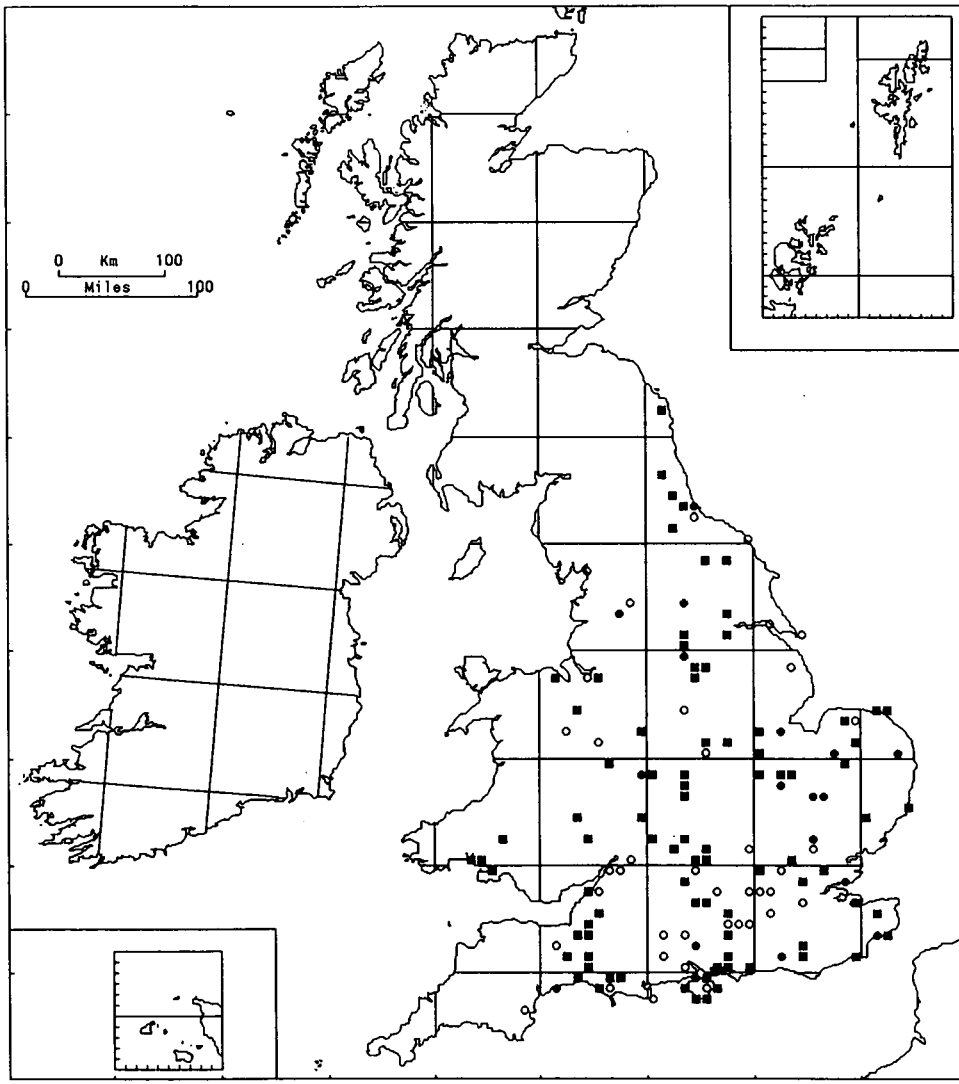
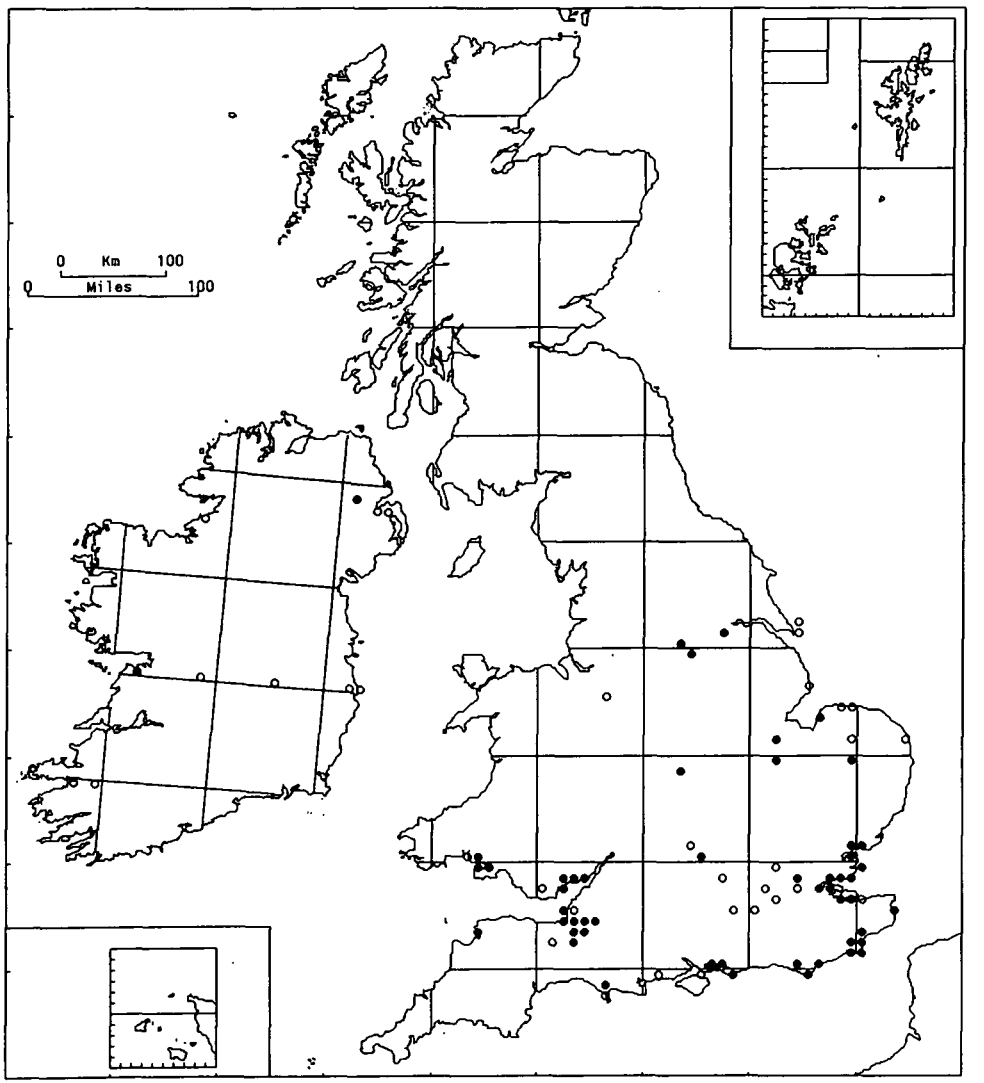


Stratiomys singularior

Map 18

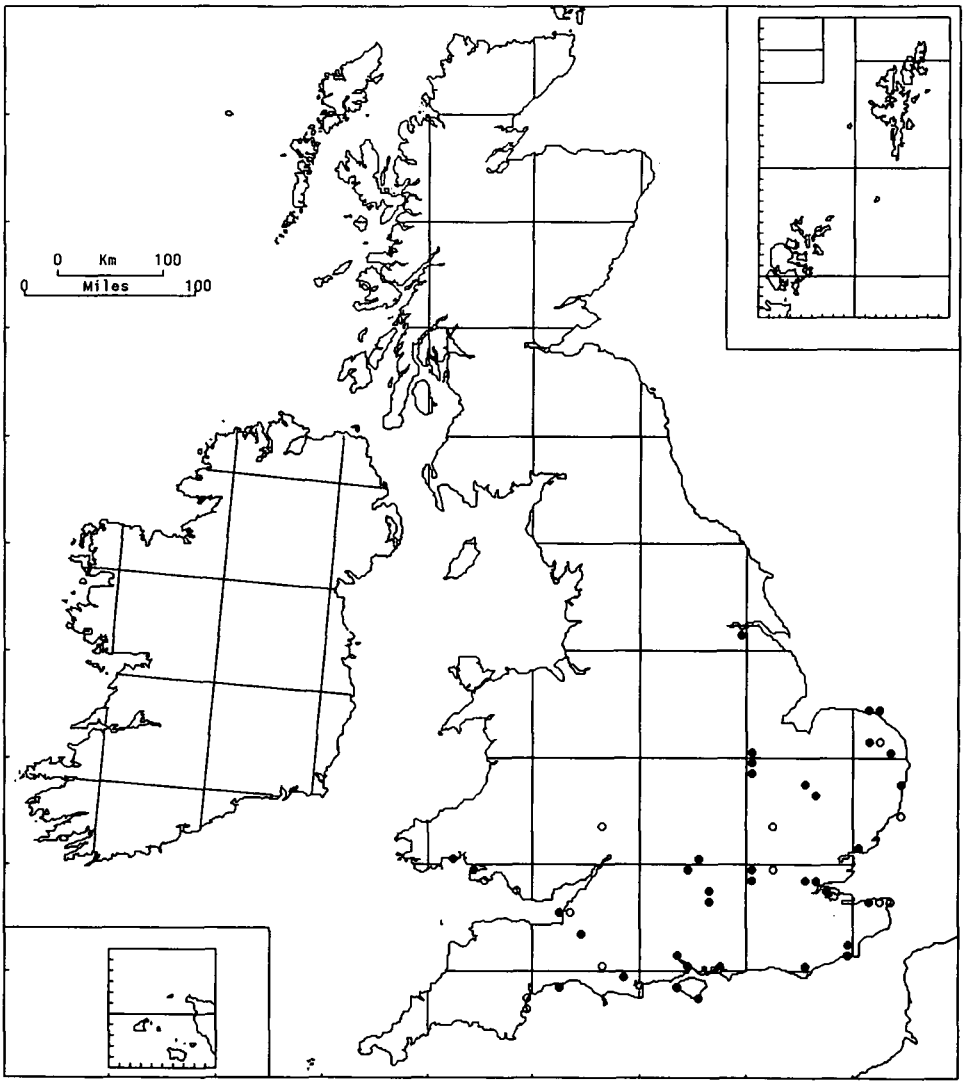
(Text on page 23)



Vanoyia tenuicornis

Map 19

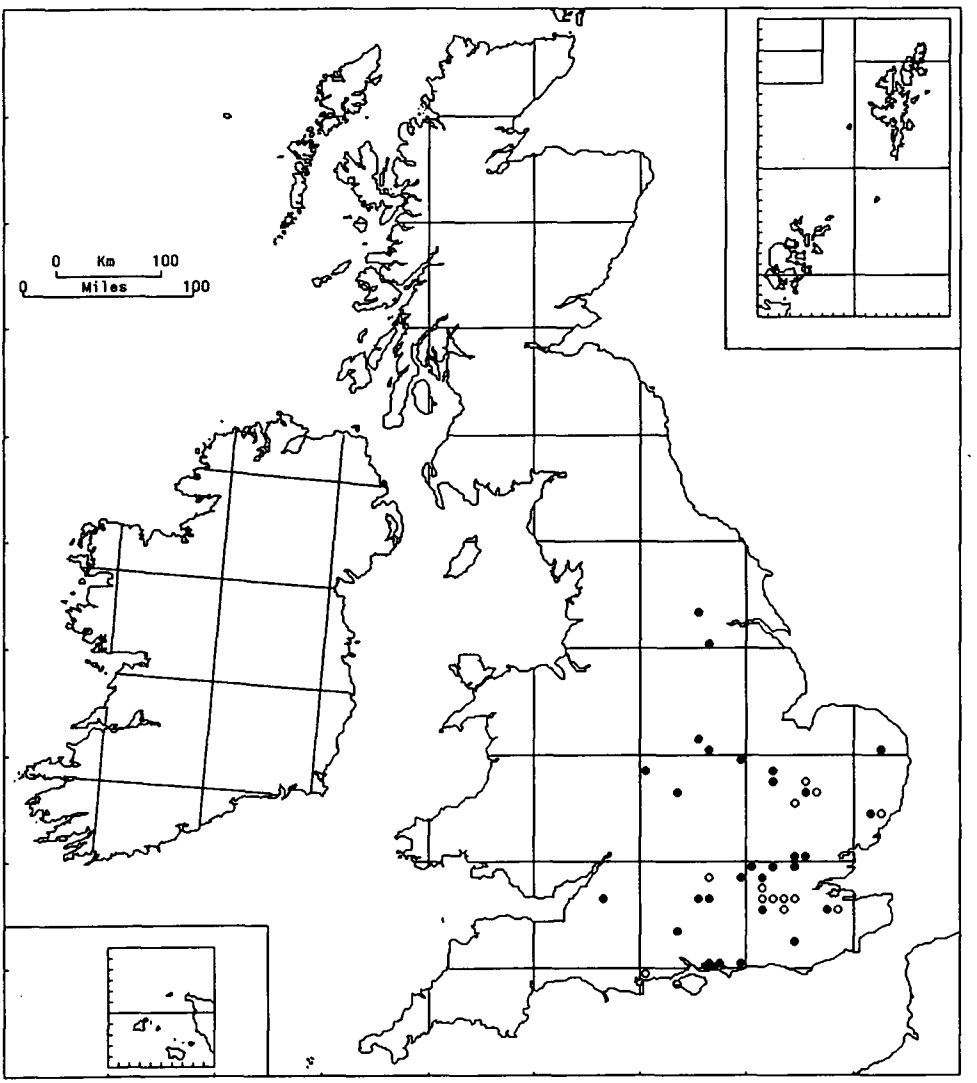
(Text on page 23)



Solva marginata

Map 20

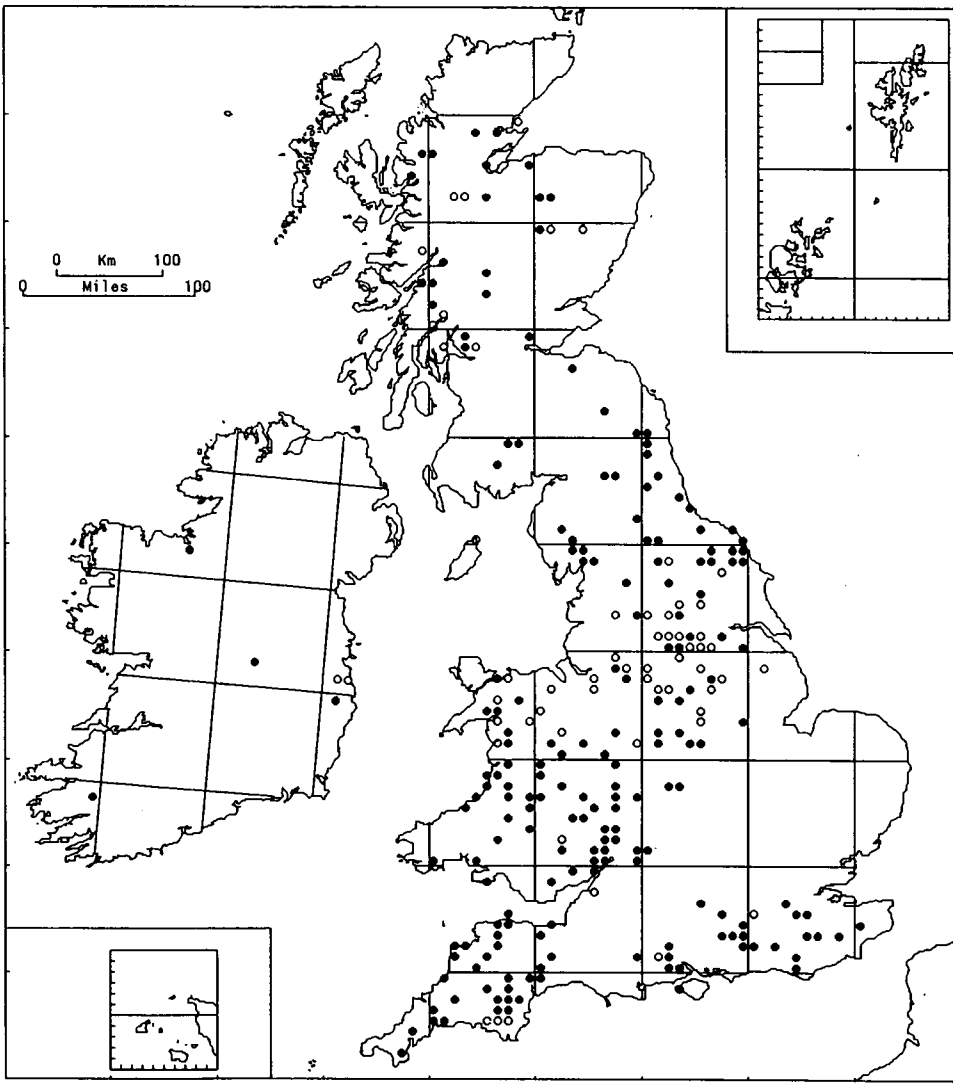
(Text on page 24)



Xylophagus ater

Map 21

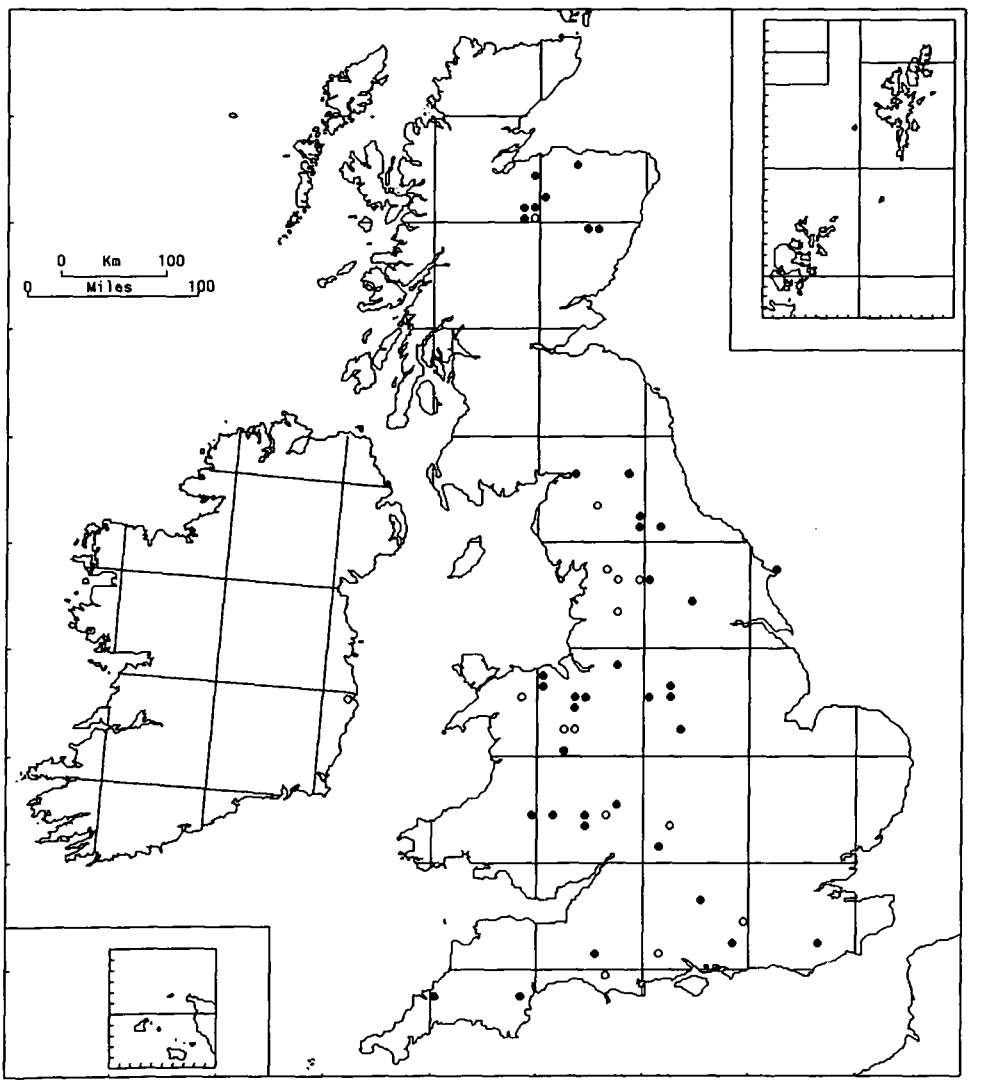
(Text on page 24)



Atherix ibis

Map 22

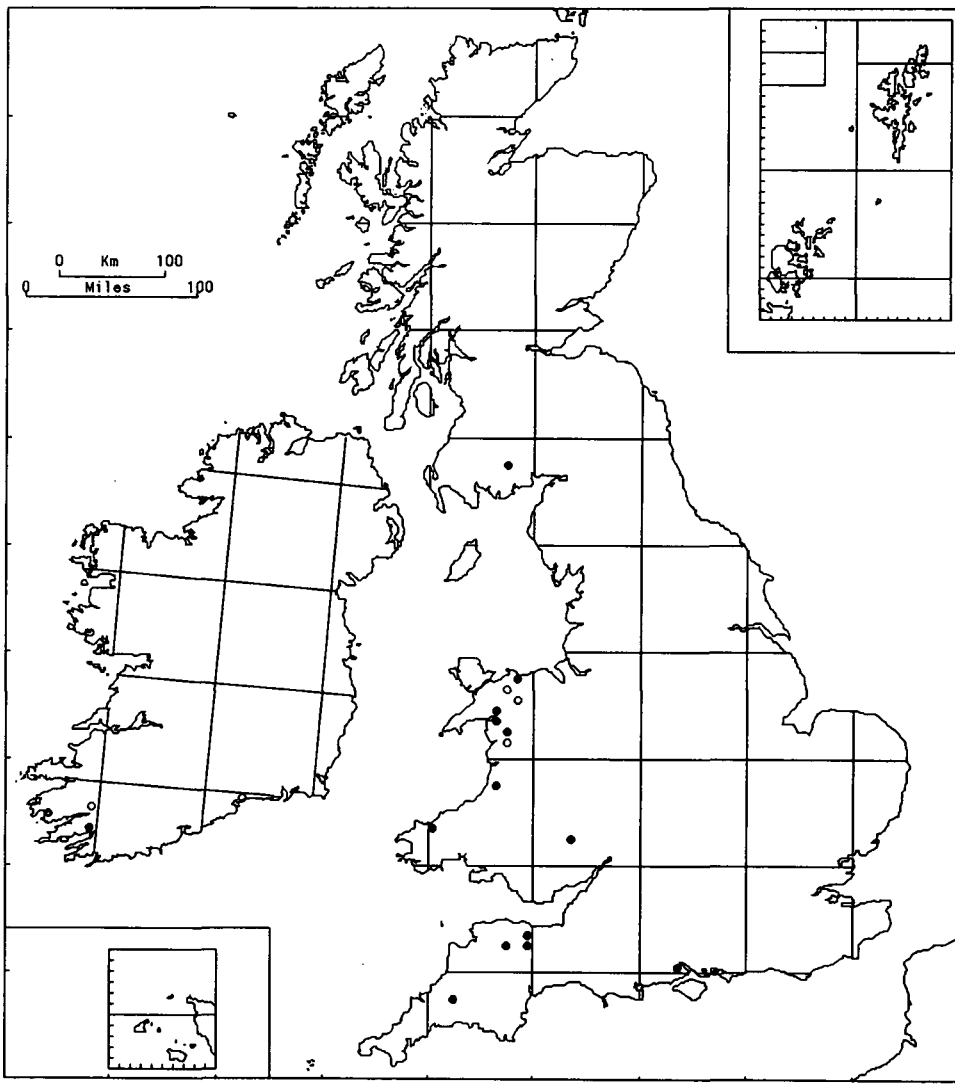
(Text on page 25)



Atherix marginata

Map 23

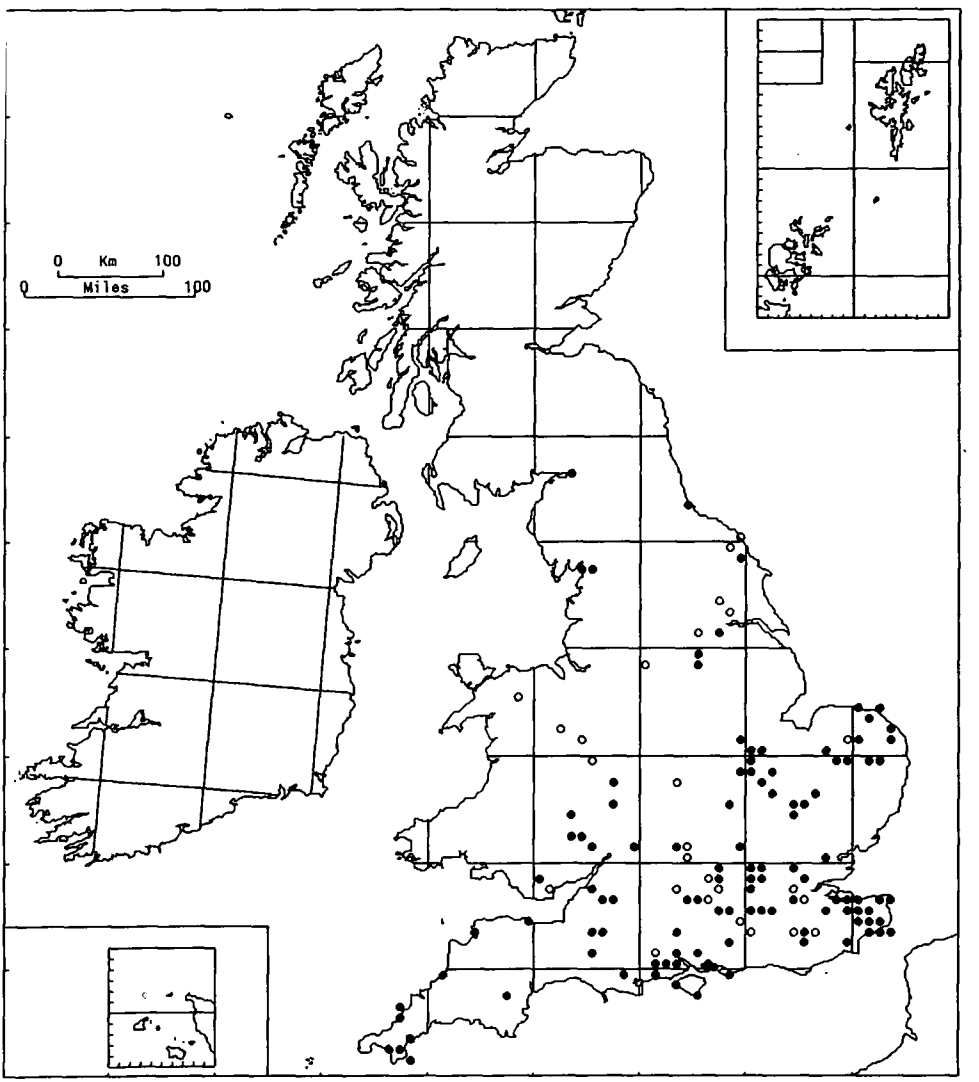
(Text on page 25)



Chrysopilus asiliformis

Map 24

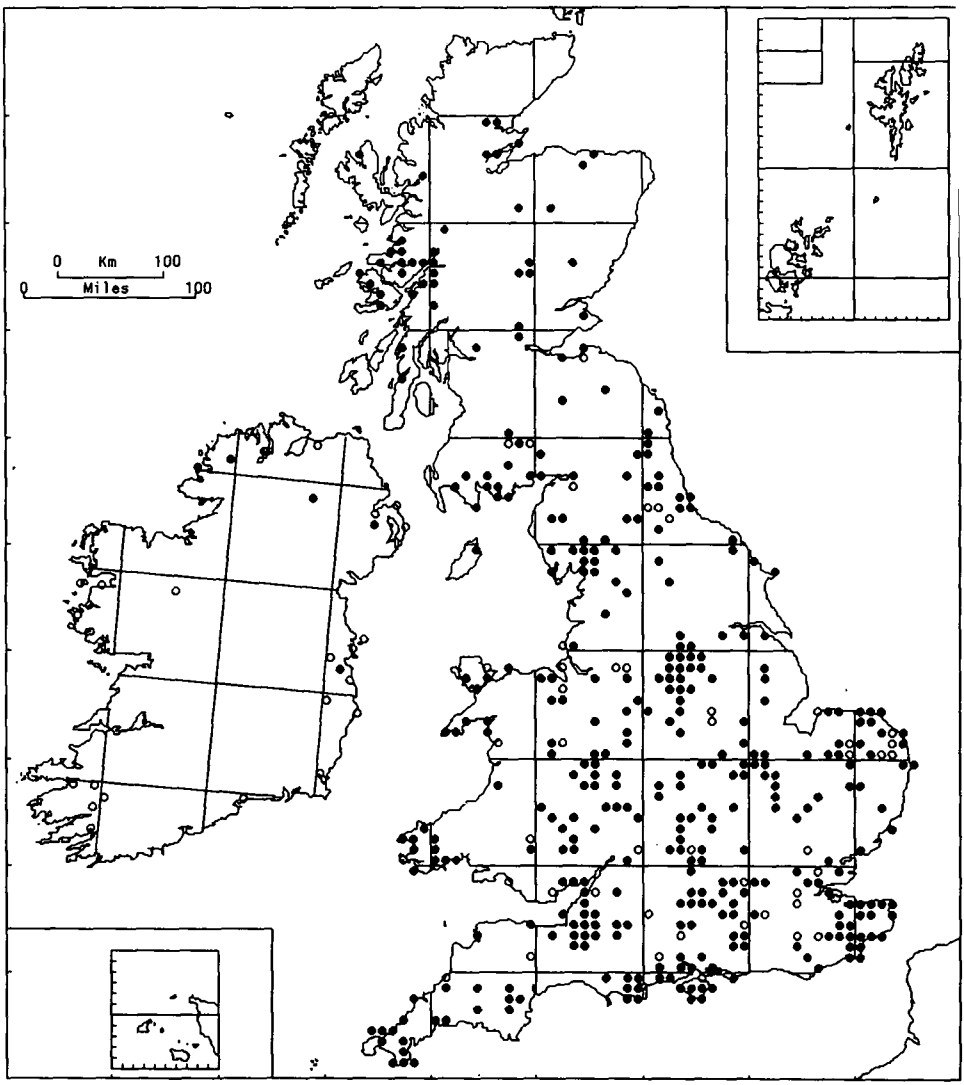
(Text on page 26)



Chrysopilus cristatus

Map 25

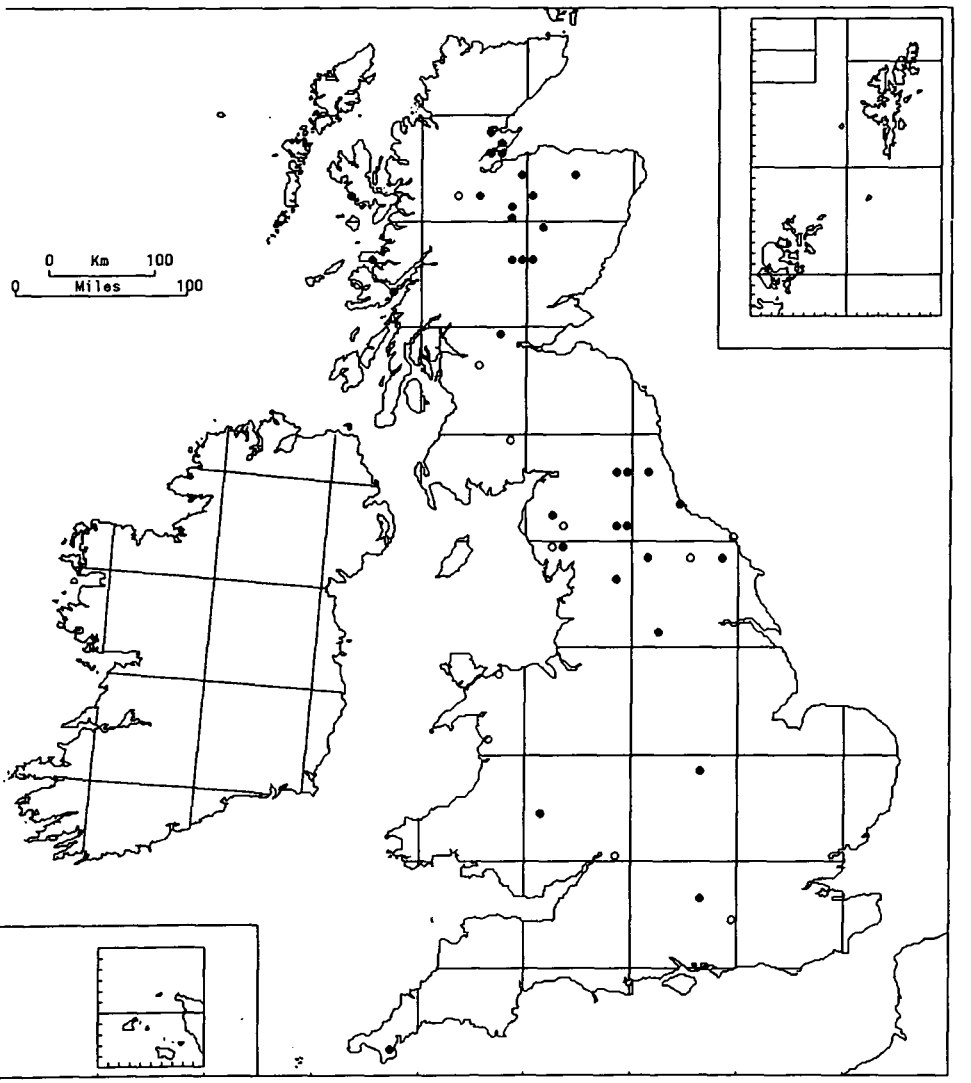
(Text on page 26)



Rhagio notatus

Map 26

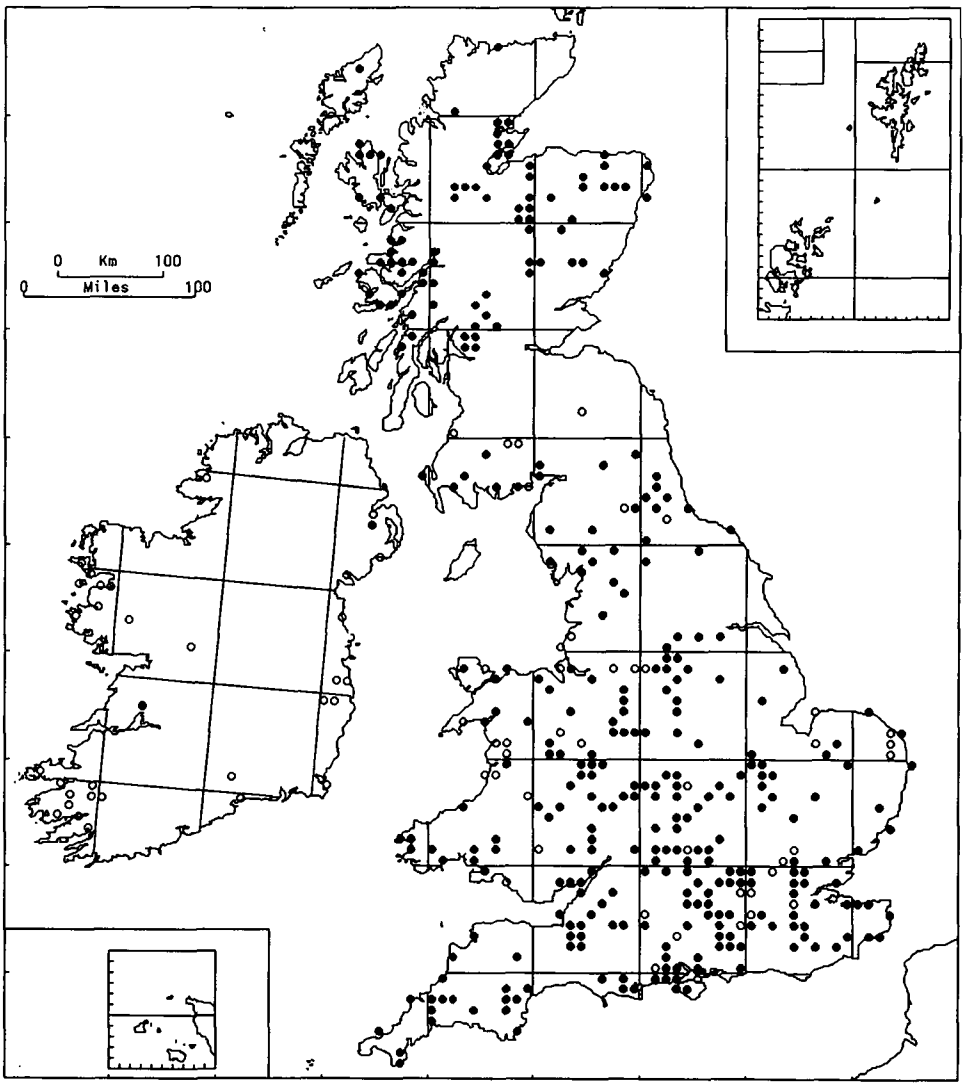
(Text on page 28)



Rhagio scolopaceus

Map 27

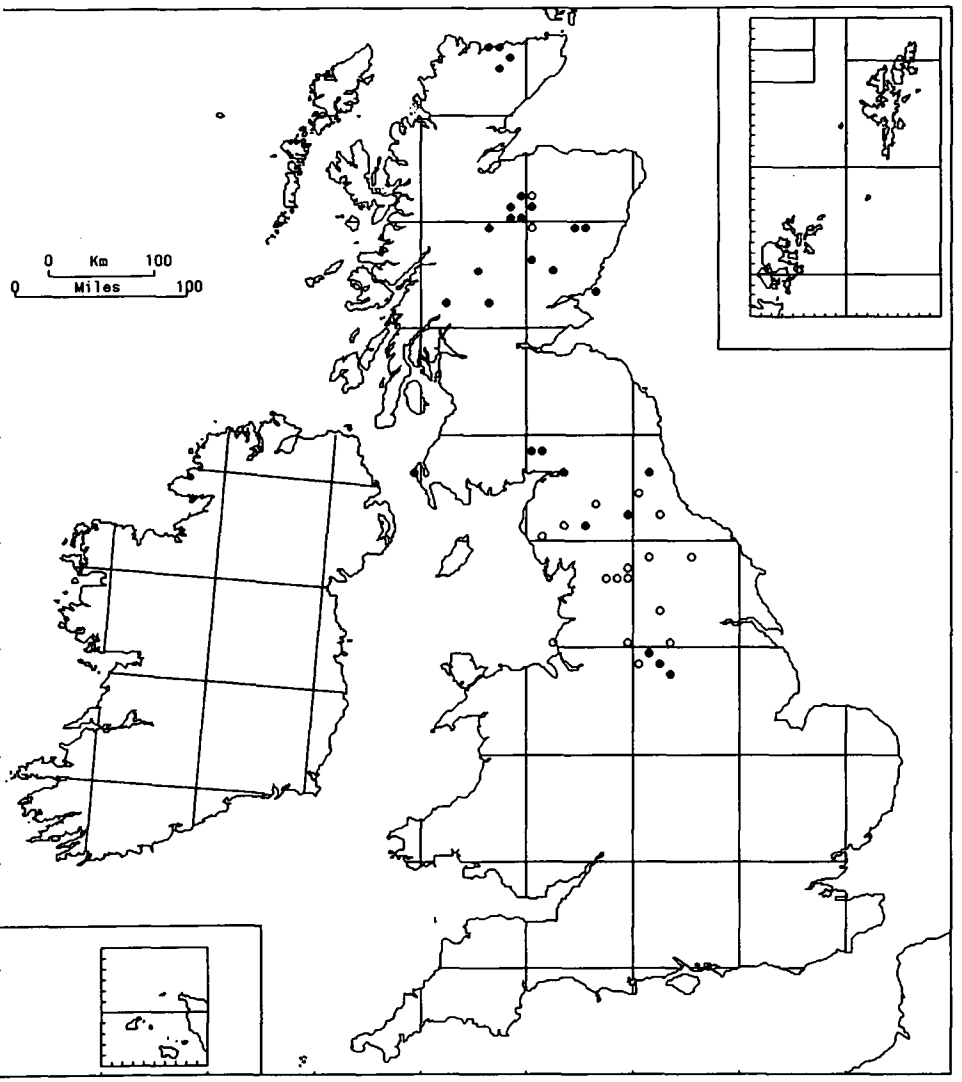
(Text on page 28)



Symphoromyia crassicornis

Map 28

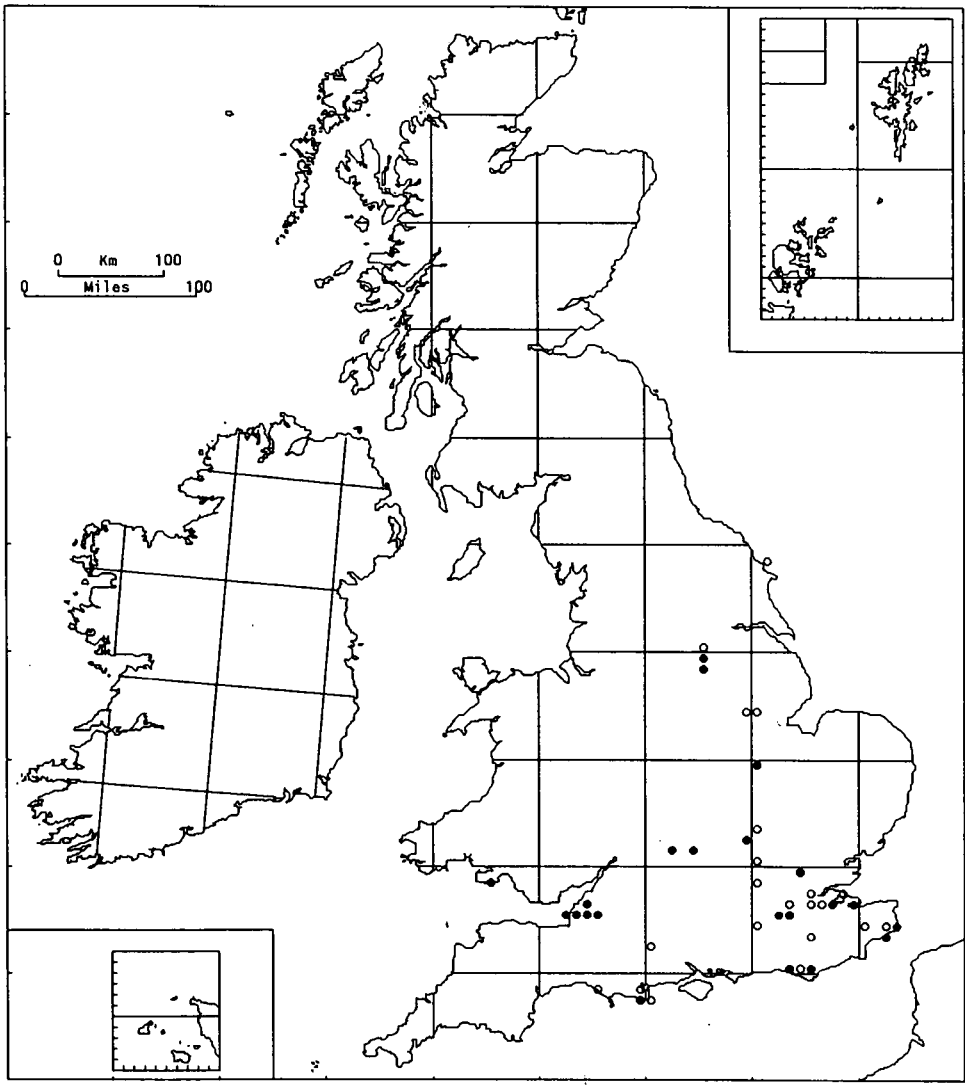
(Text on page 29)



Symphoromyia immaculata

Map 29

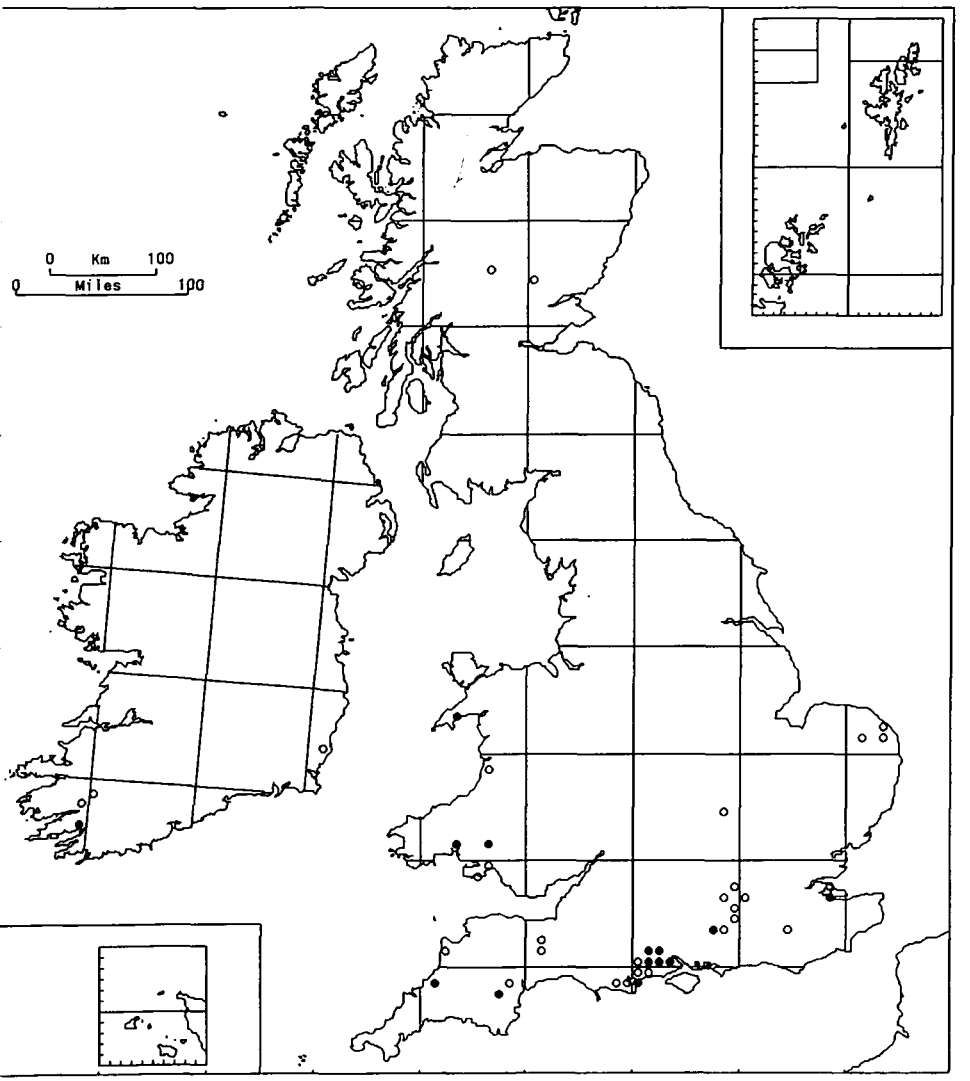
(Text on page 29)



Atylotus fulvus

Map 30

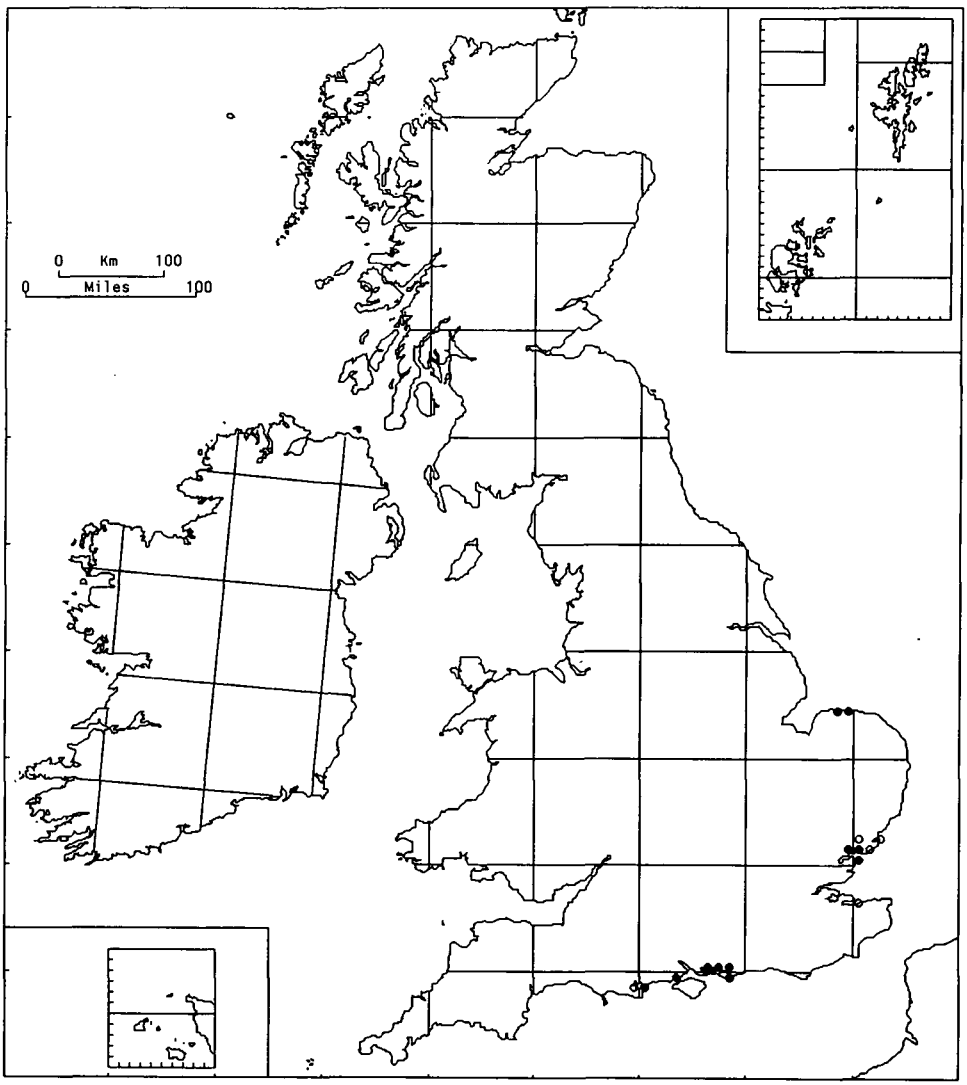
(Text on page 29)



Atylotus latistriatus

Map 31

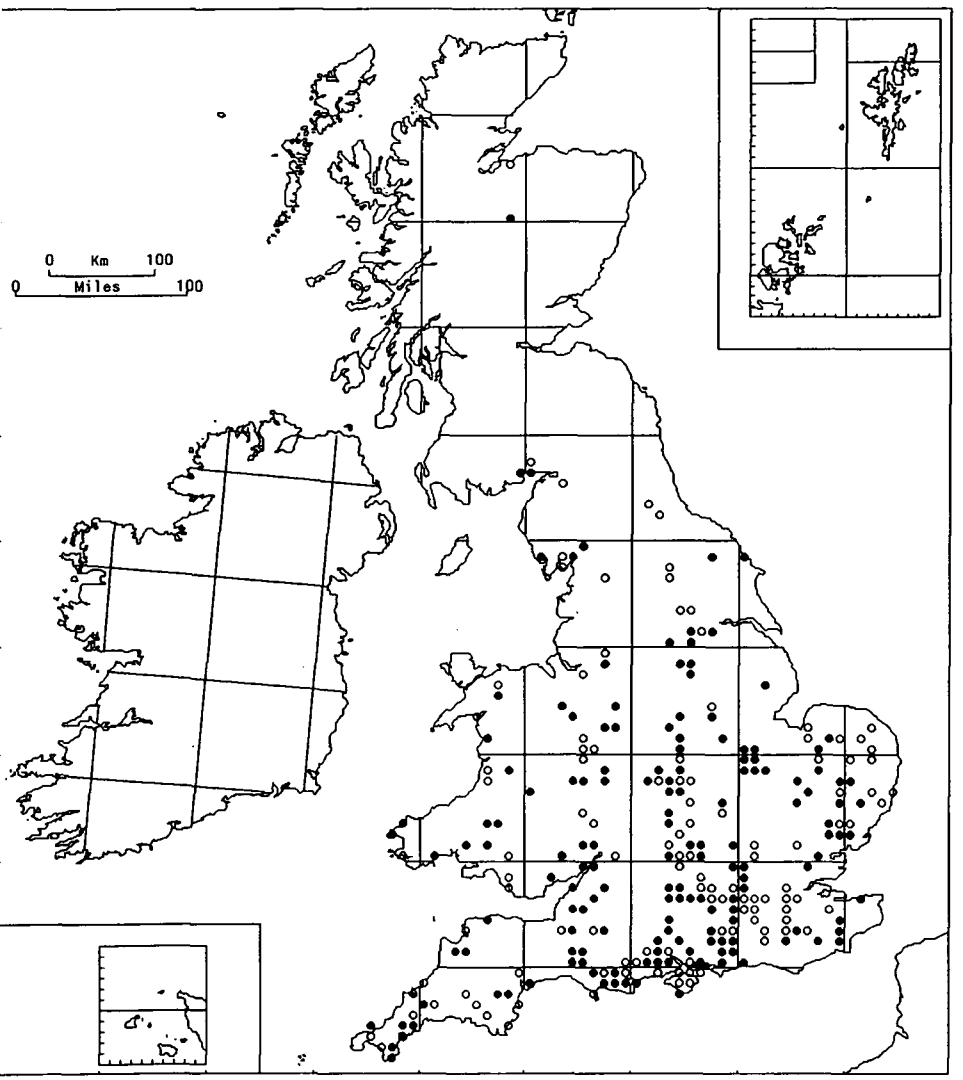
(Text on page 29)



Chrysops caecutiens

Map 32

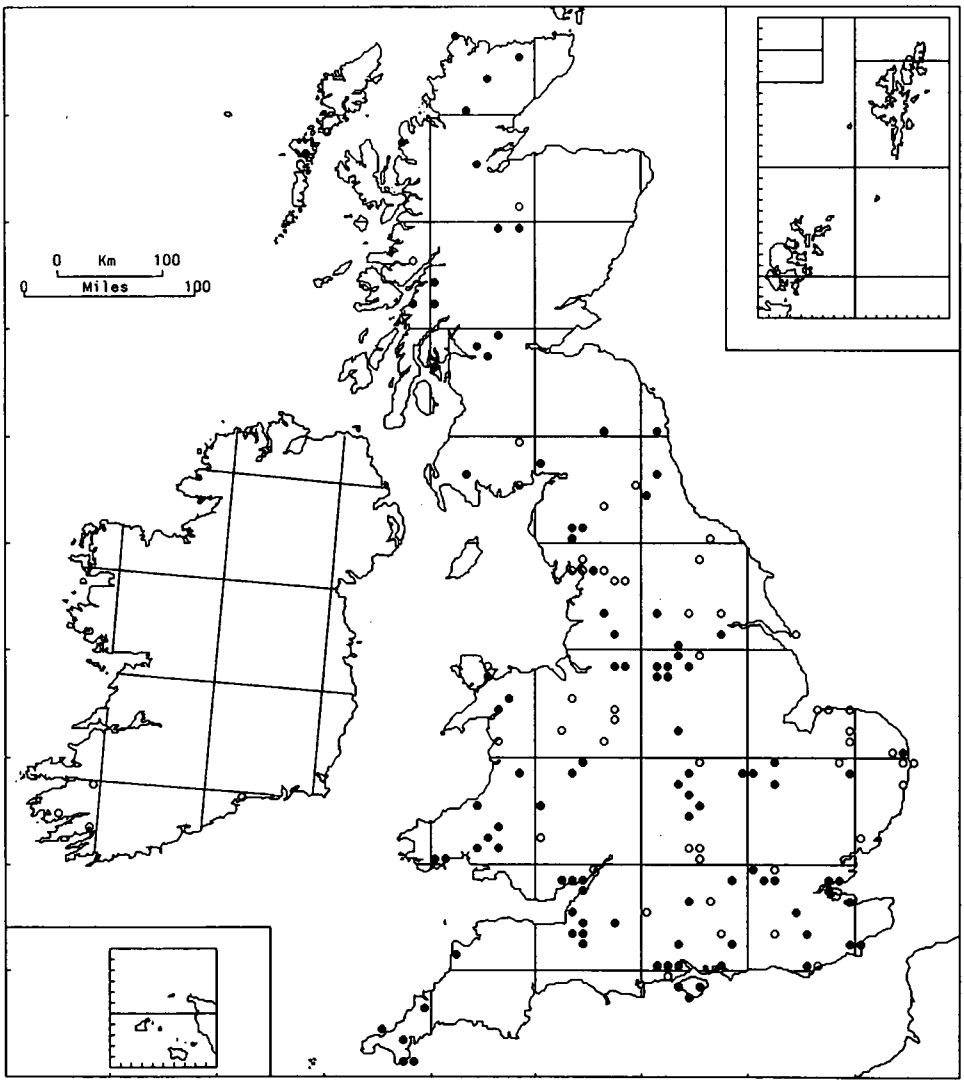
(Text on page 30)



Haematopota crassicornis

Map 33

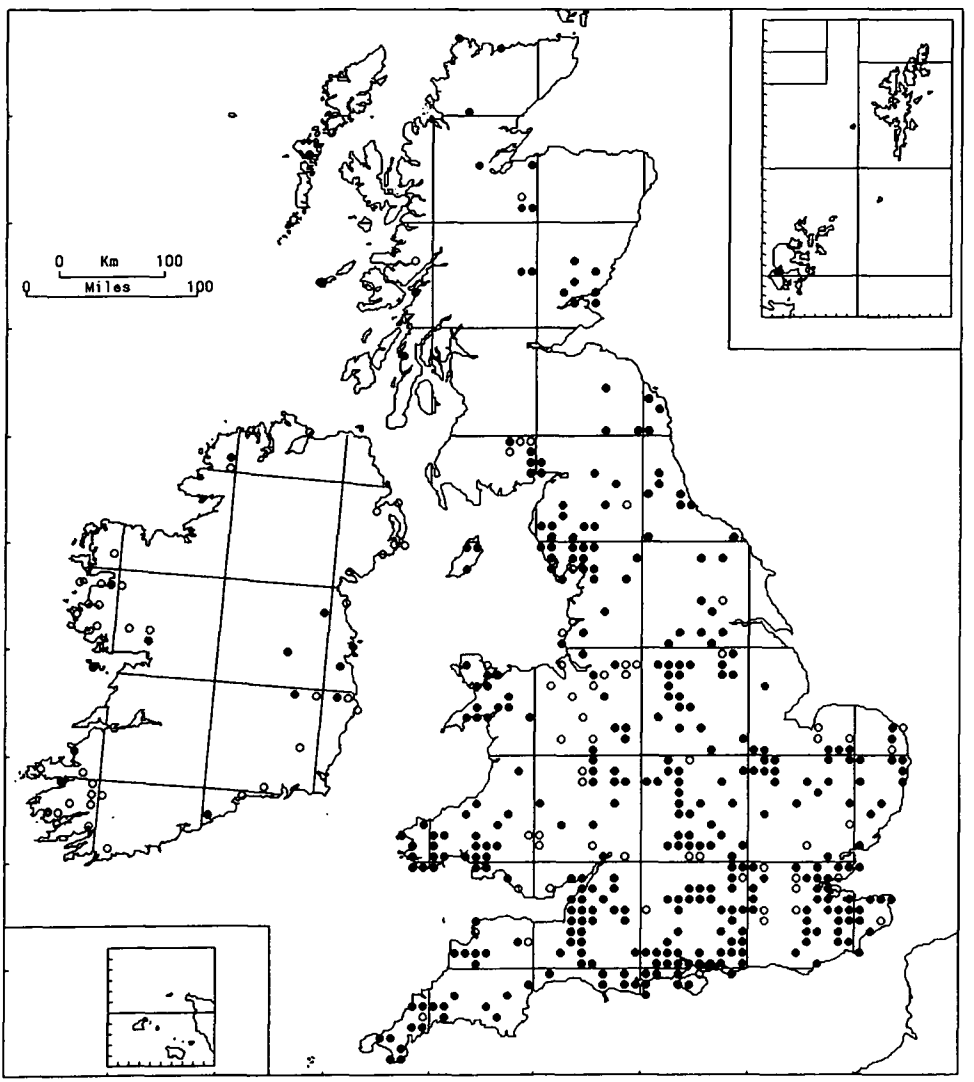
(Text on page 31)



Haematopota pluvialis

Map 34

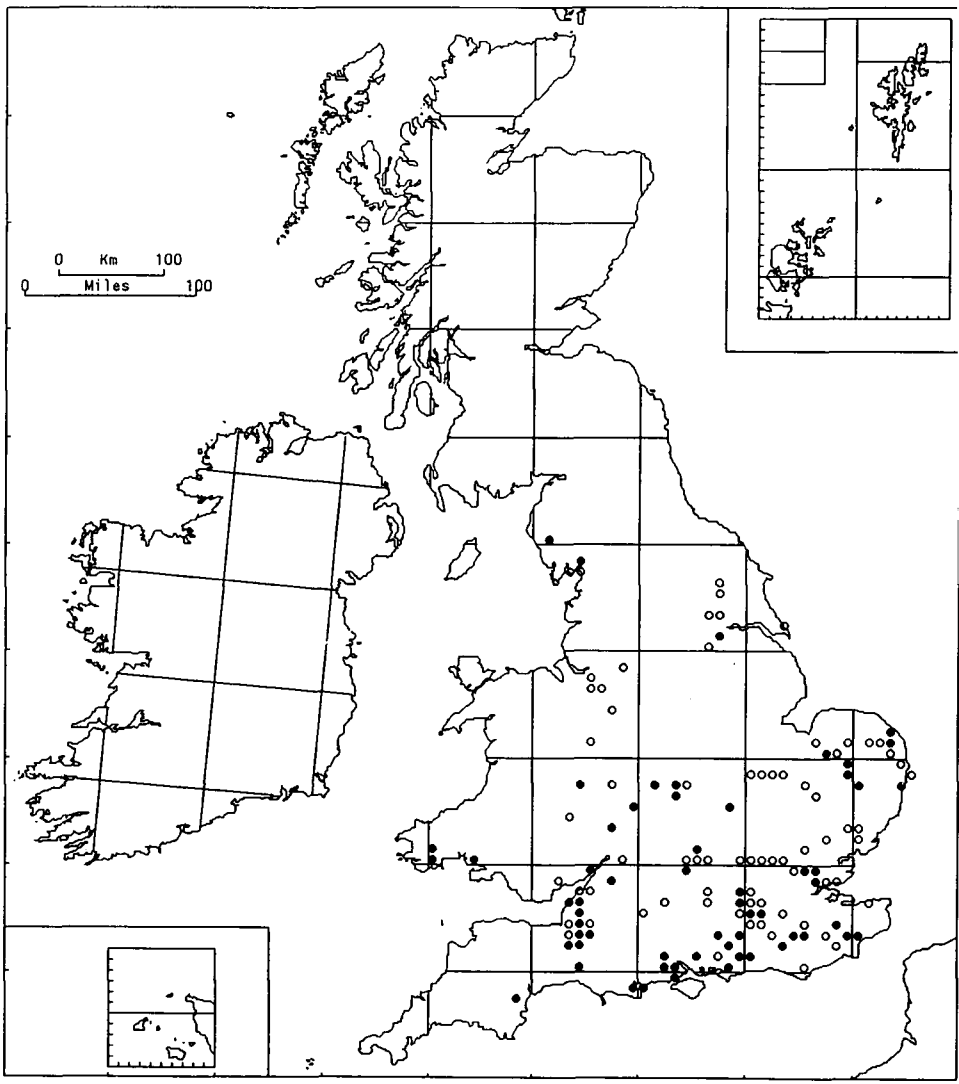
(Text on page 31)



Hybomitra bimaculata

Map 35

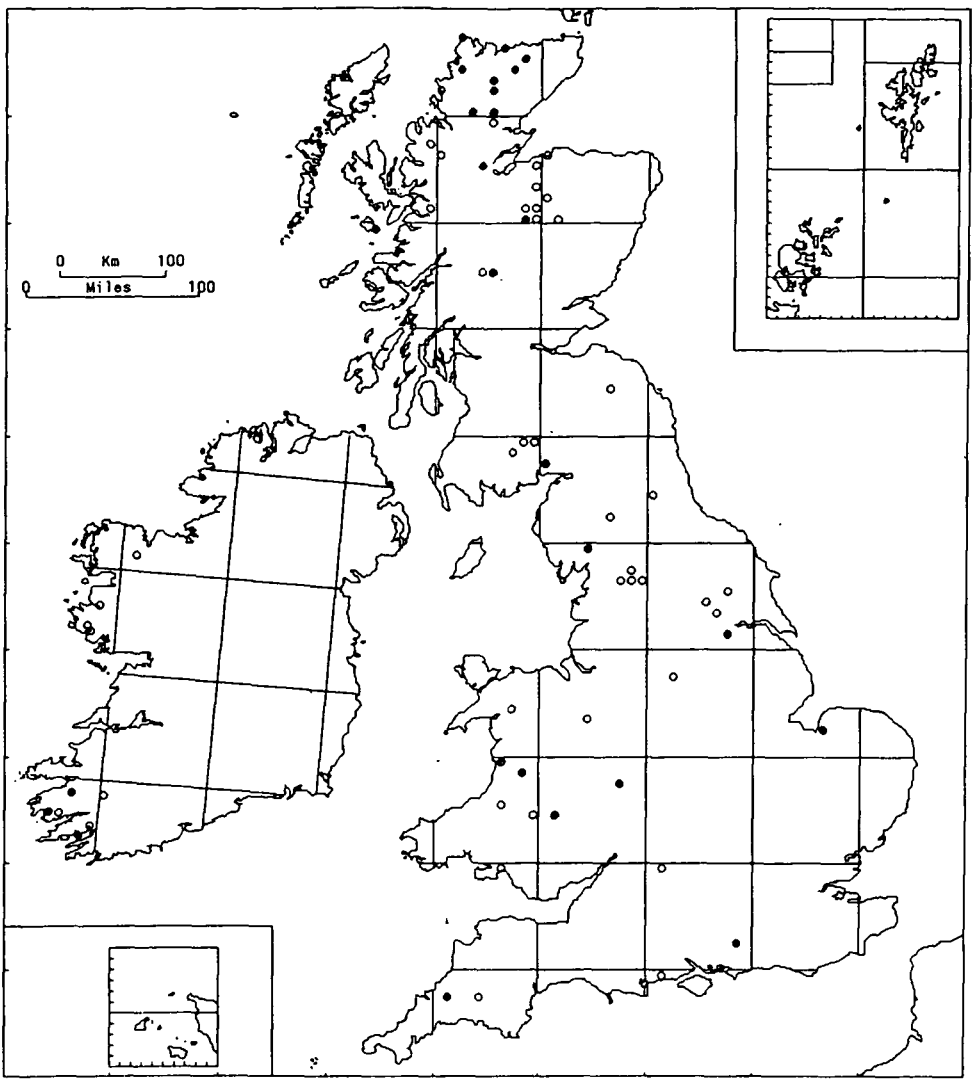
(Text on page 31)



Hybomitra montana

Map 36

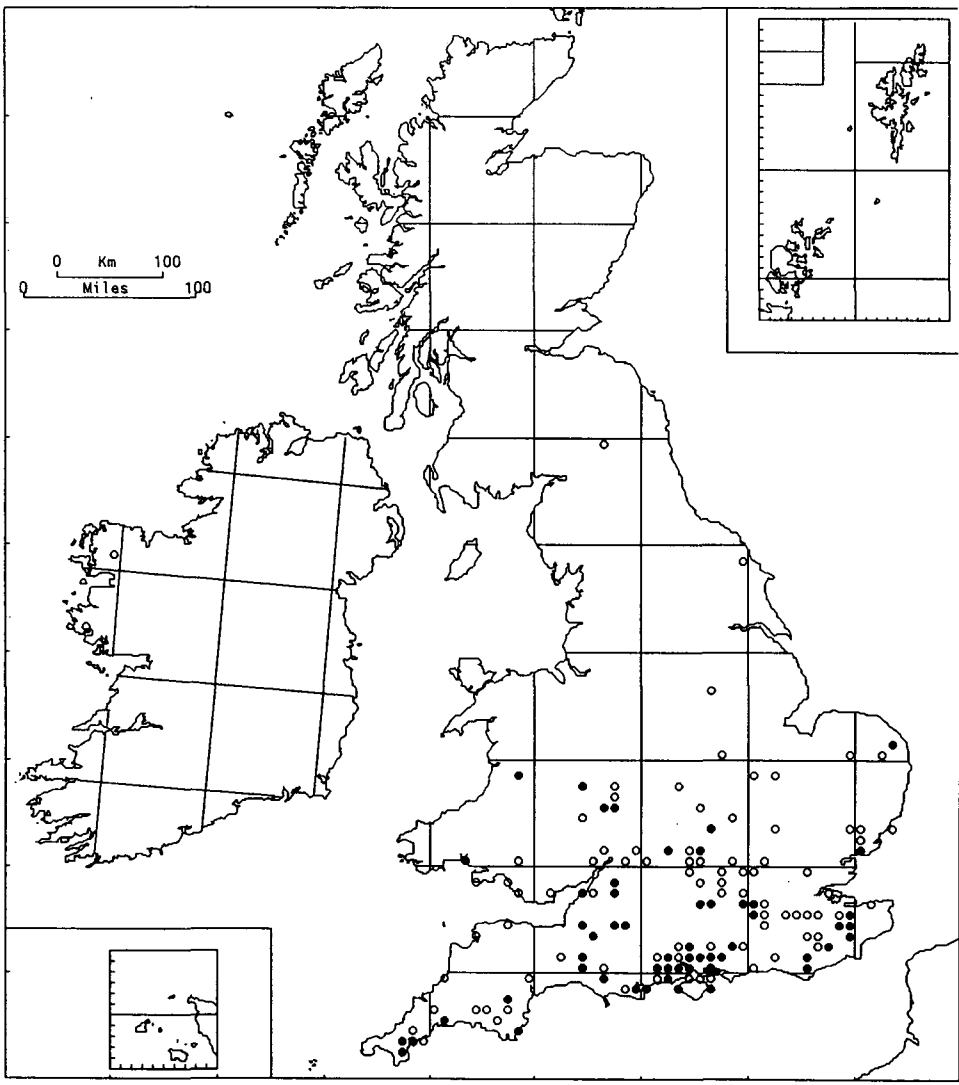
(Text on page 33)



Tabanus bromius

Map 37

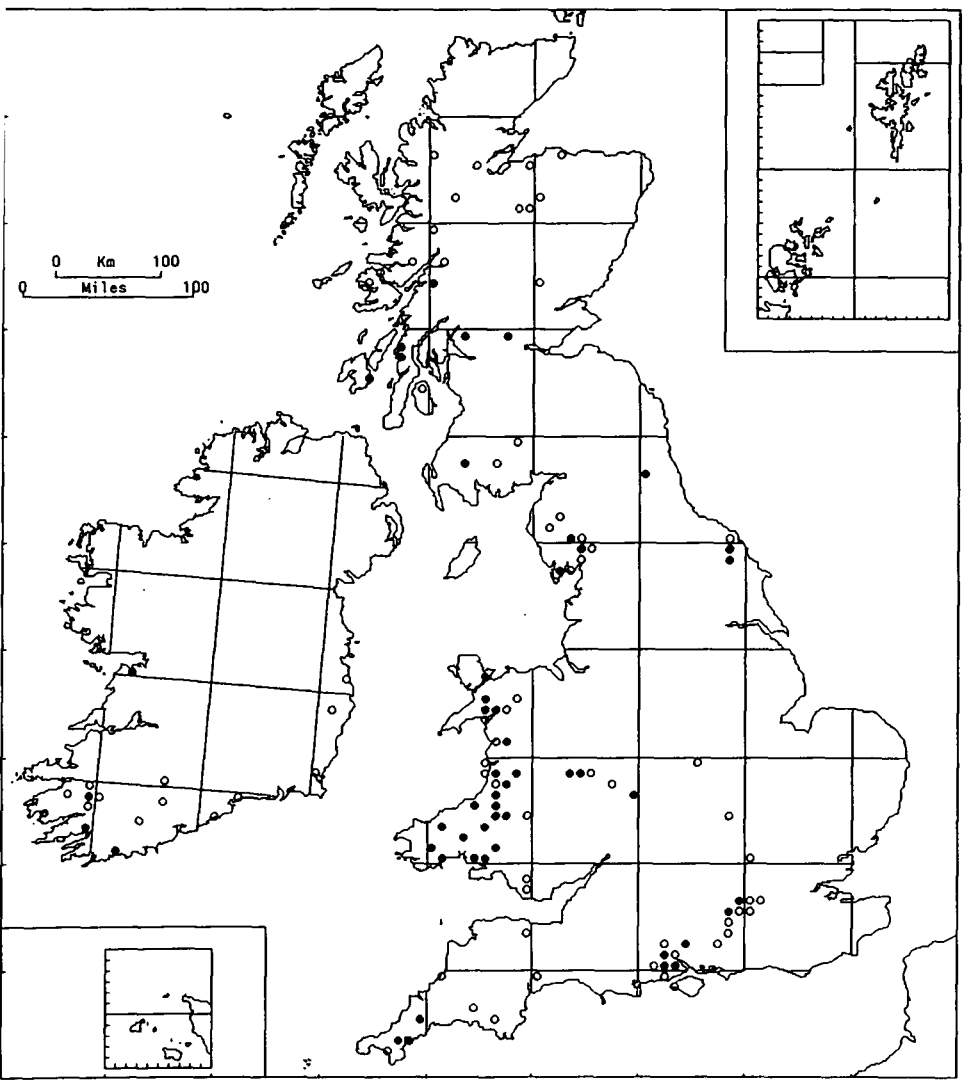
(Text on page 34)



Tabanus sudeticus

Map 38

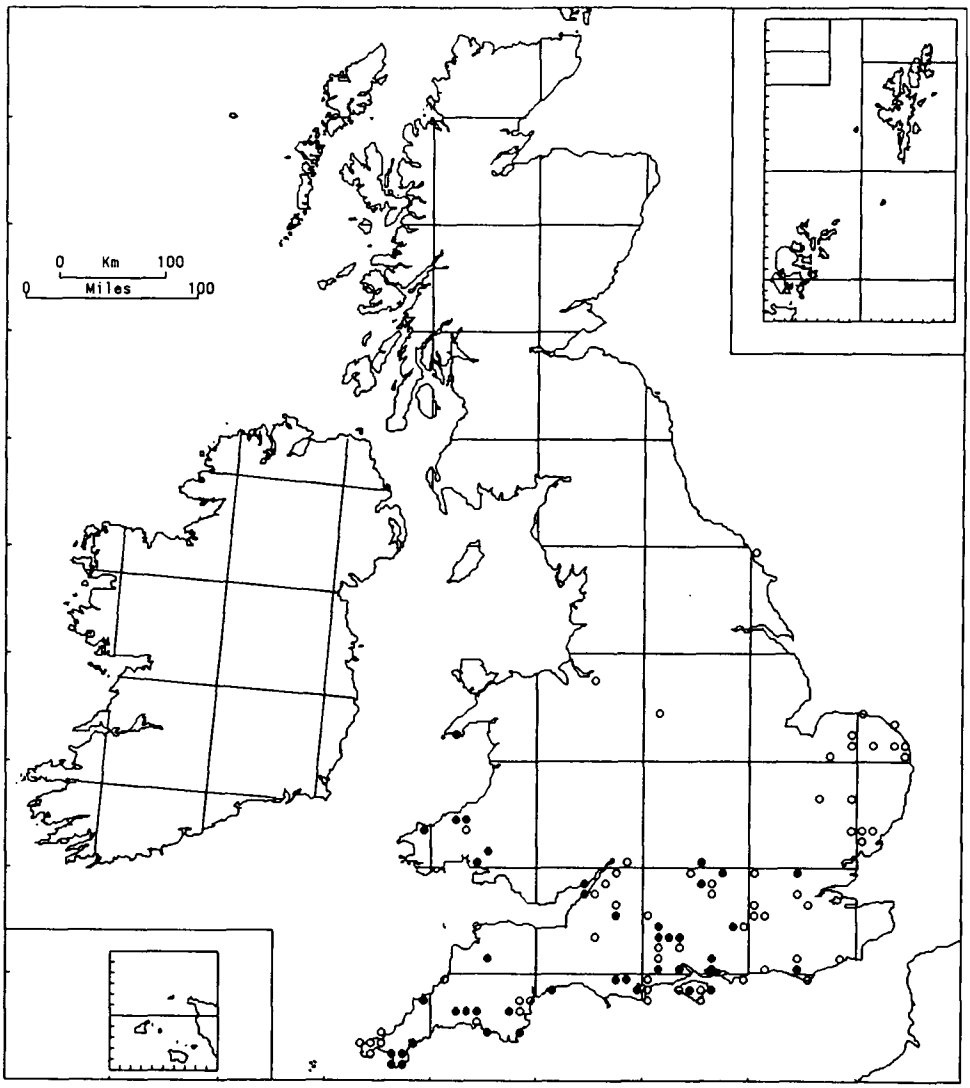
(Text on page 35)



Asilus crabroniformis

Map 39

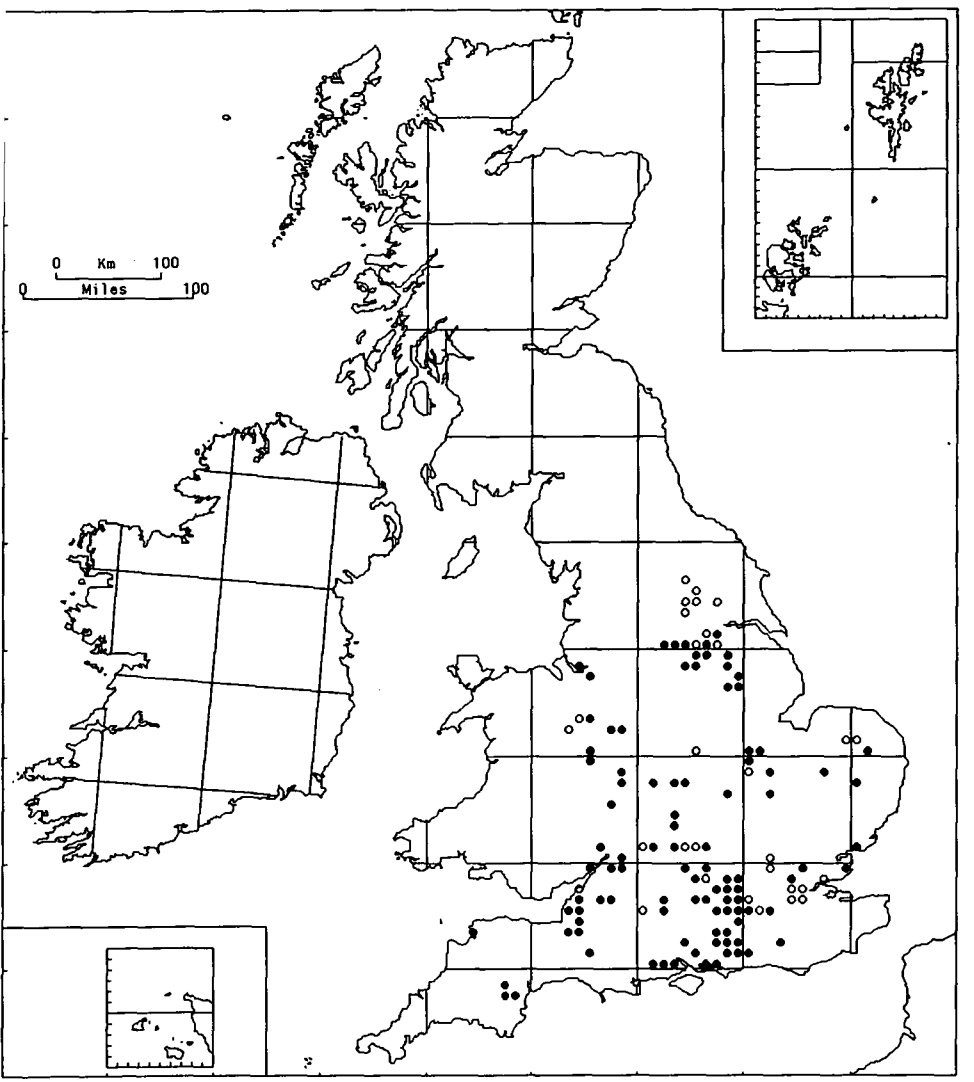
(Text on page 36)



Dioctria atricapilla

Map 40

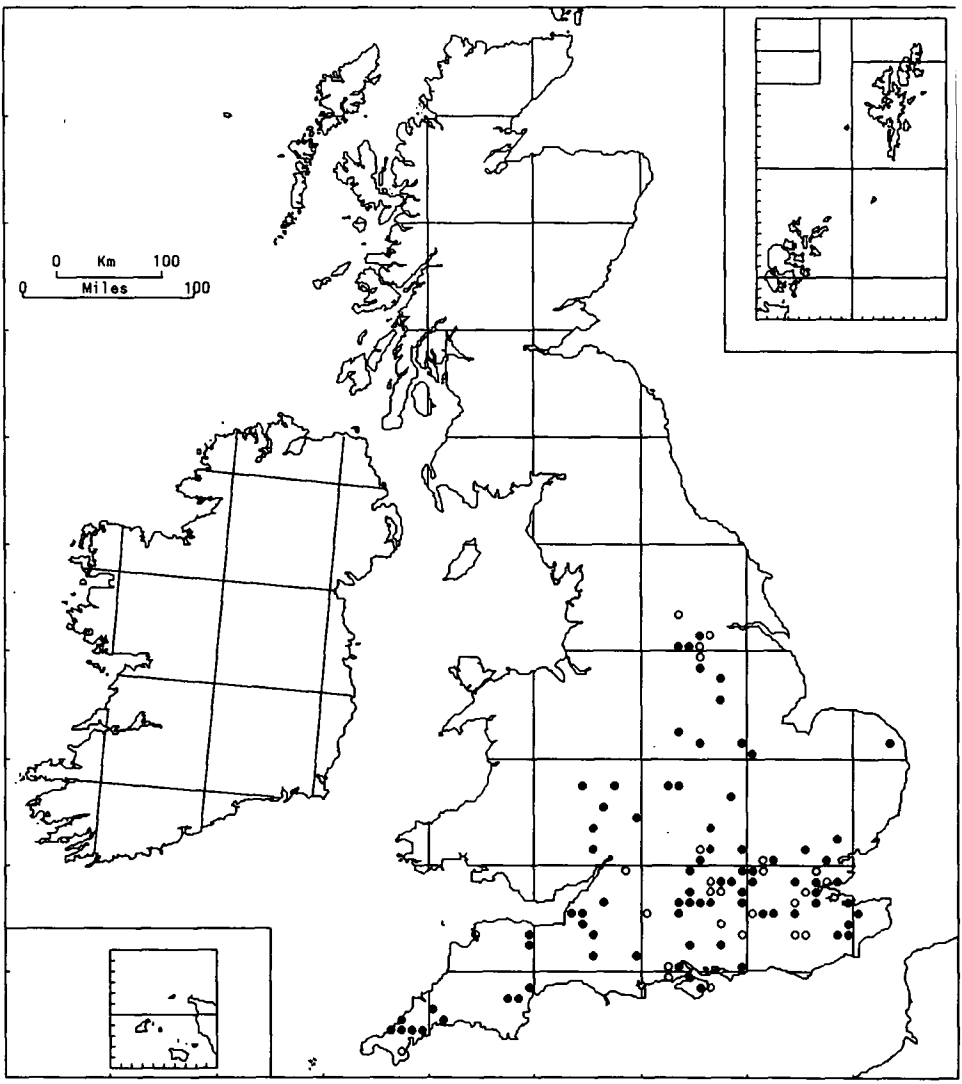
(Text on page 36)



Dioctria linearis

Map 41

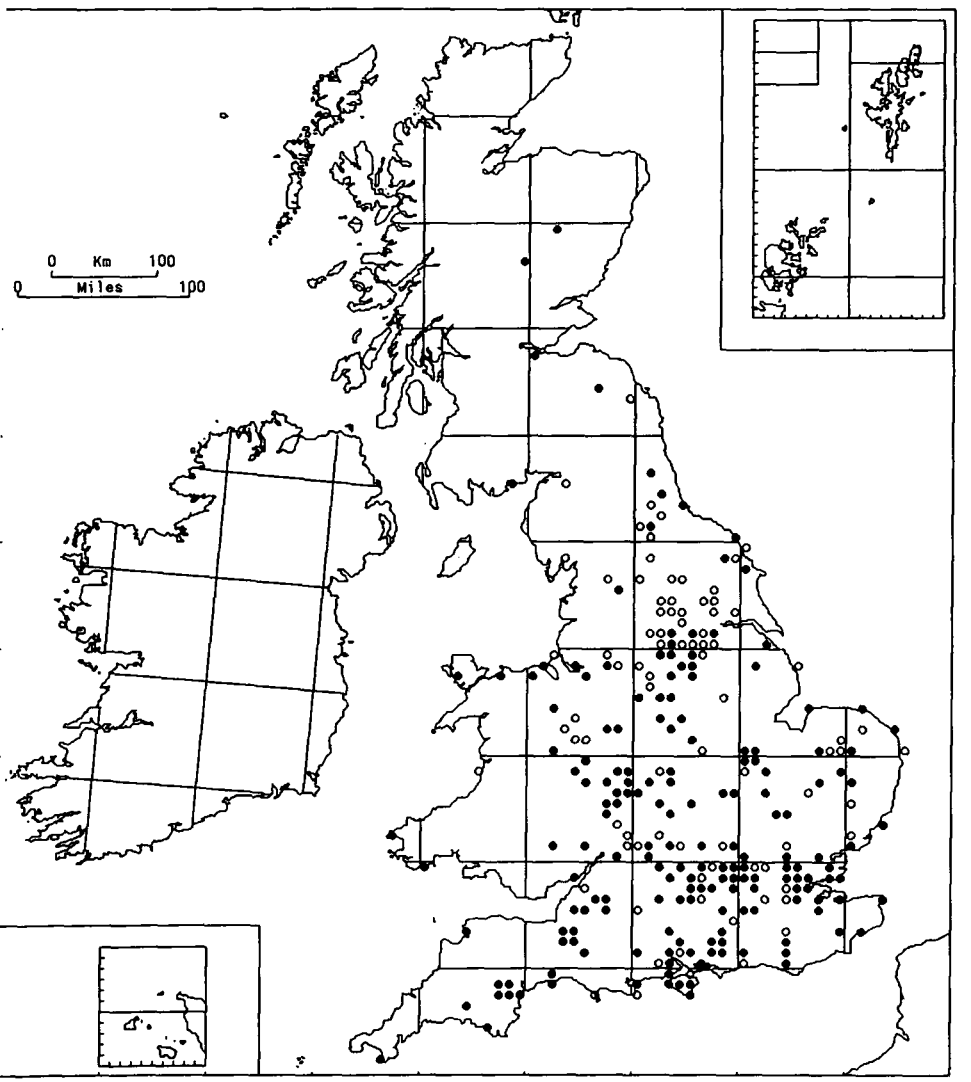
(Text on page 37)



Dioctria rufipes

Map 42

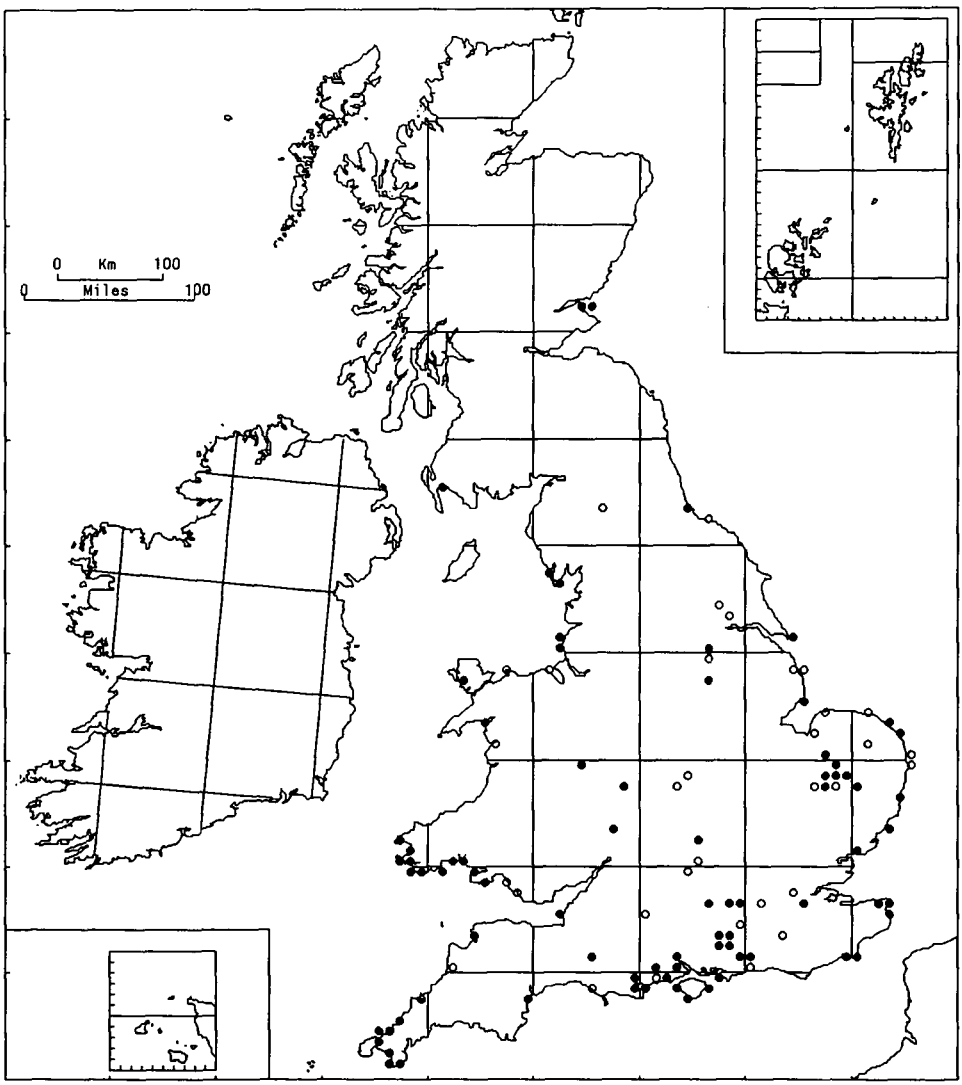
(Text on page 37)



Dysmachus trigonus

Map 43

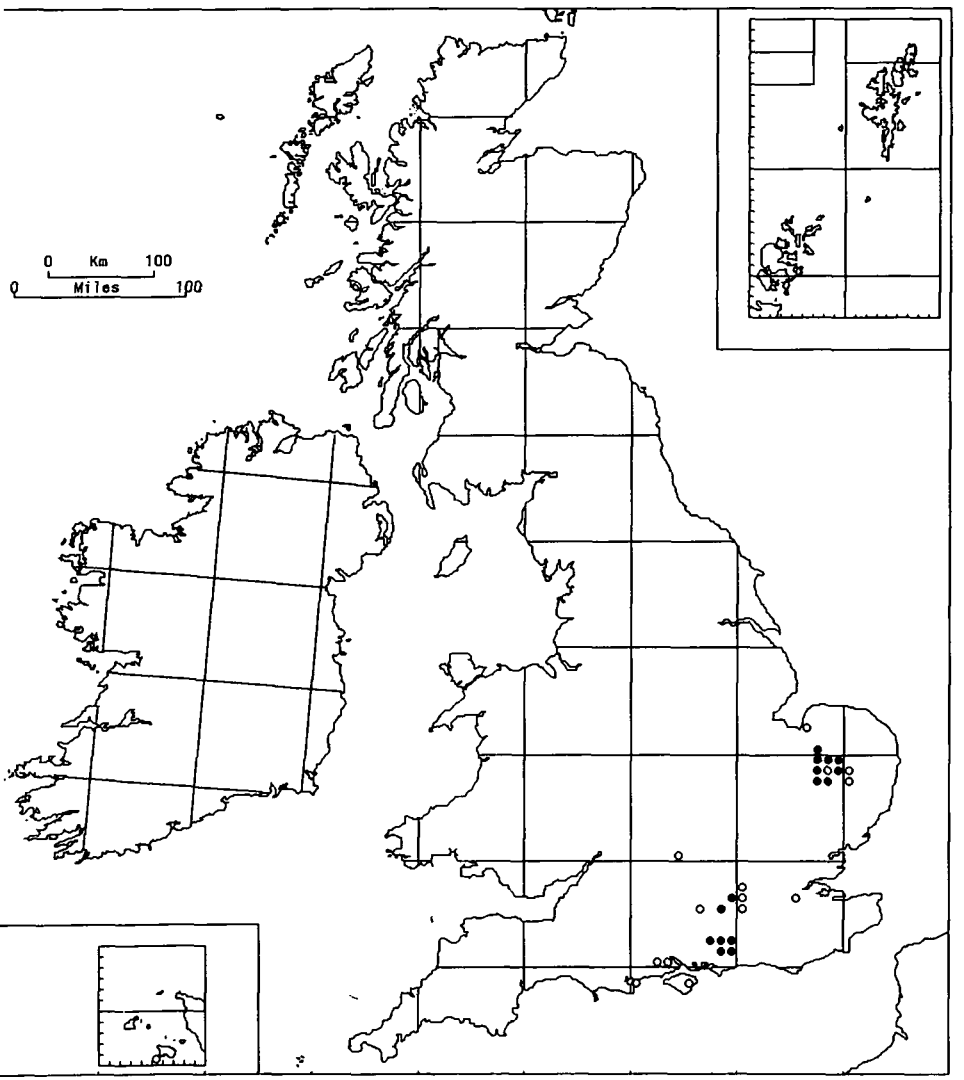
(Text on page 37)



Eutolmus rufibarbis

Map 44

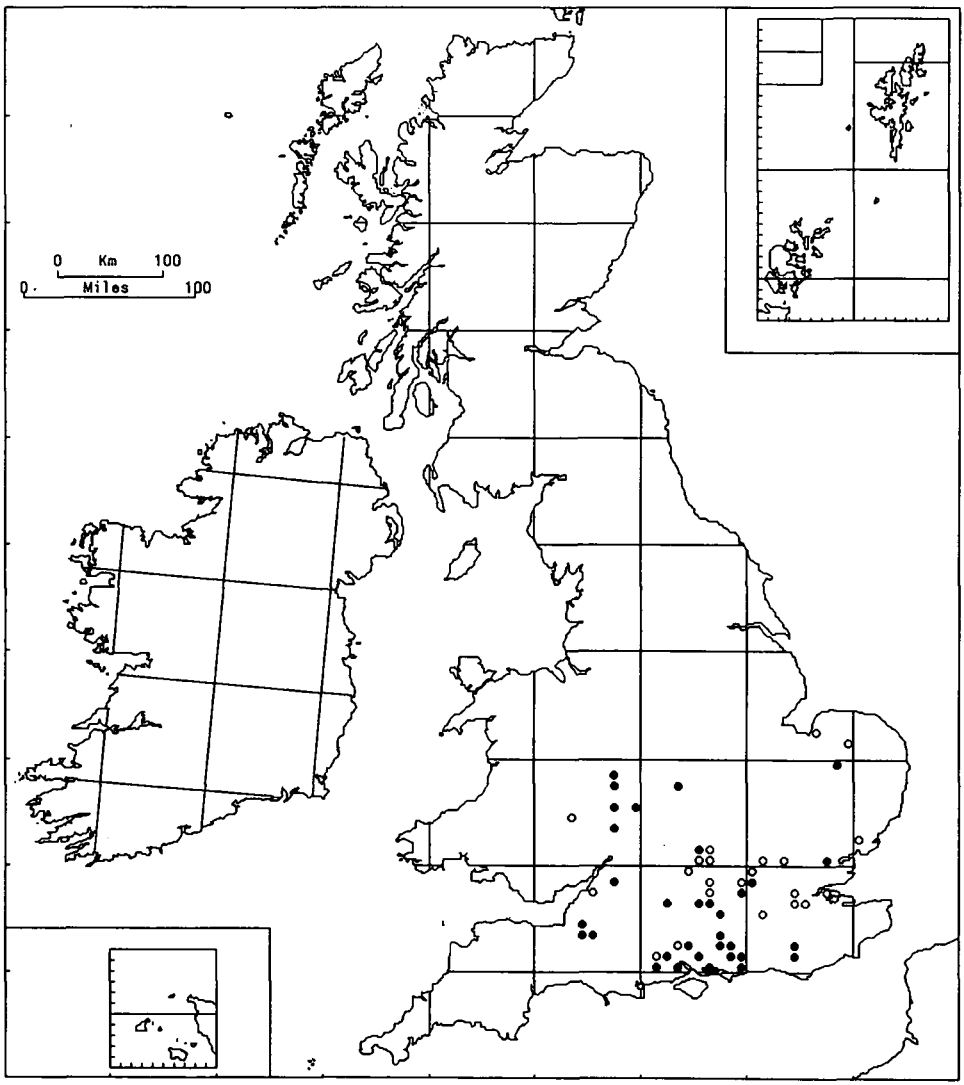
(Text on page 38)



Laphria marginata

Map 45

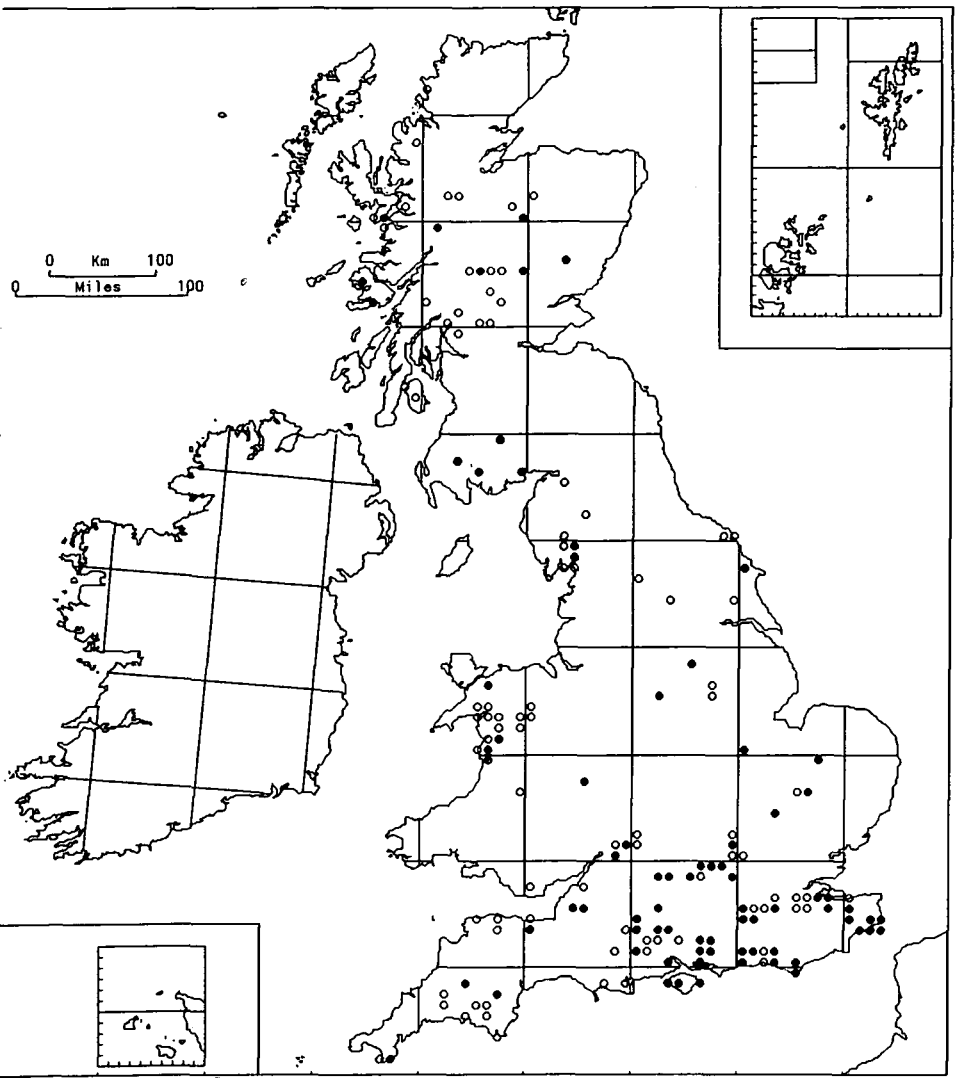
(Text on page 39)



Leptarthrus brevirostris

Map 46

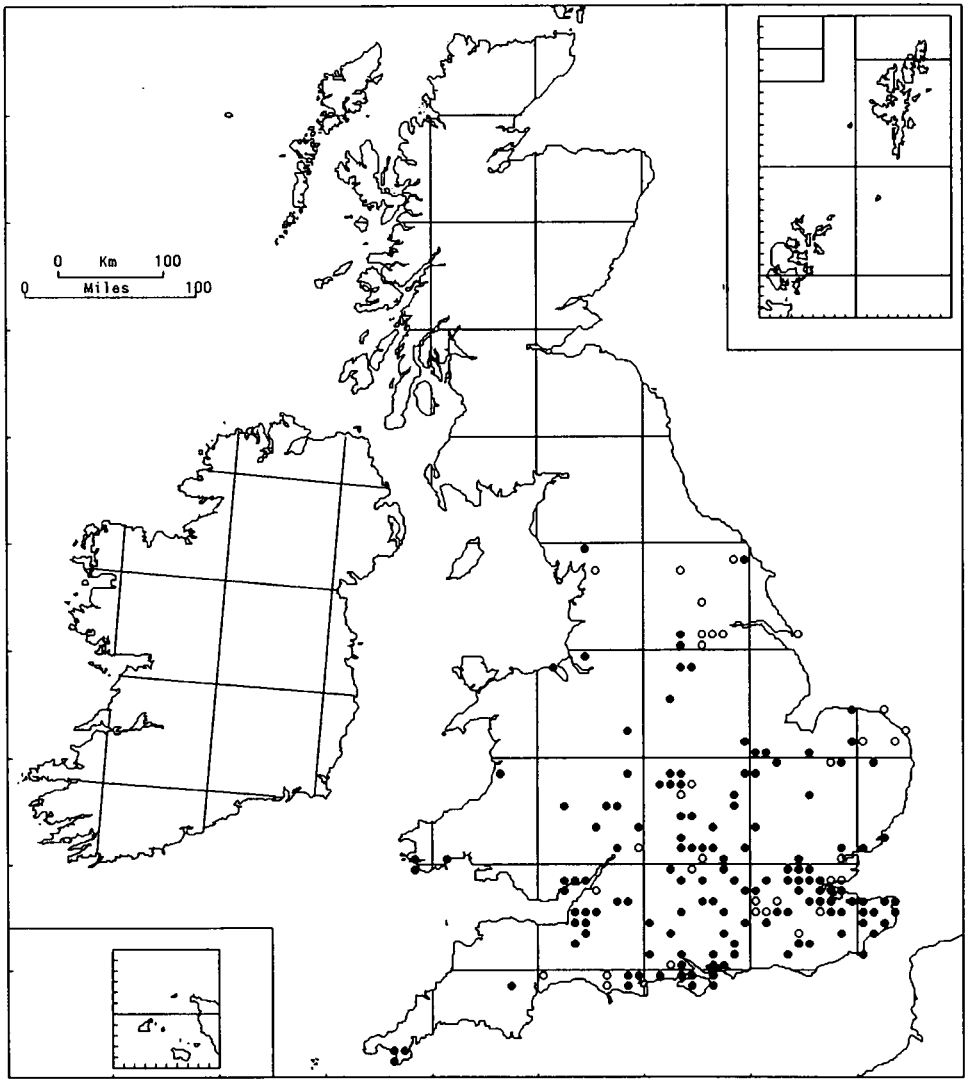
(Text on page 39)



Leptogaster cylindrica

Map 47

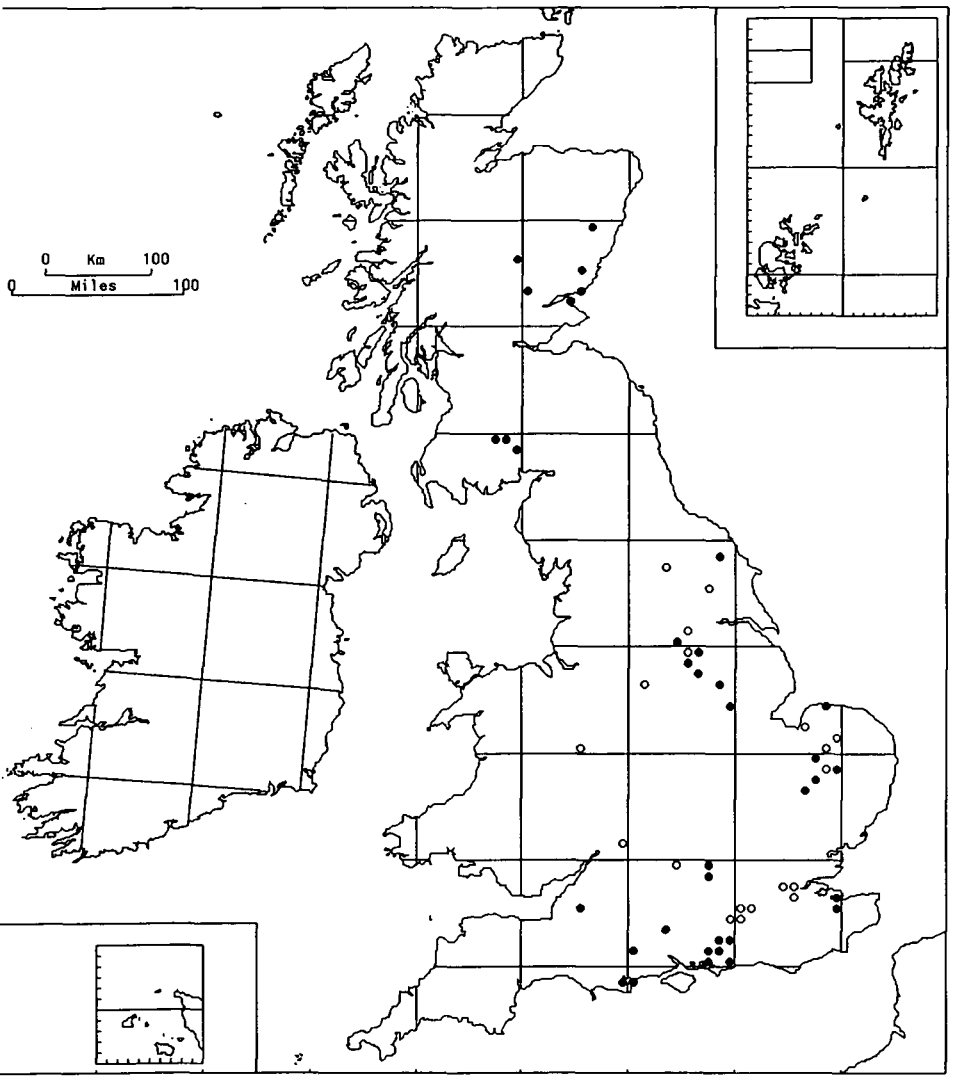
(Text on page 39)



Leptogaster guttiventris

Map 48

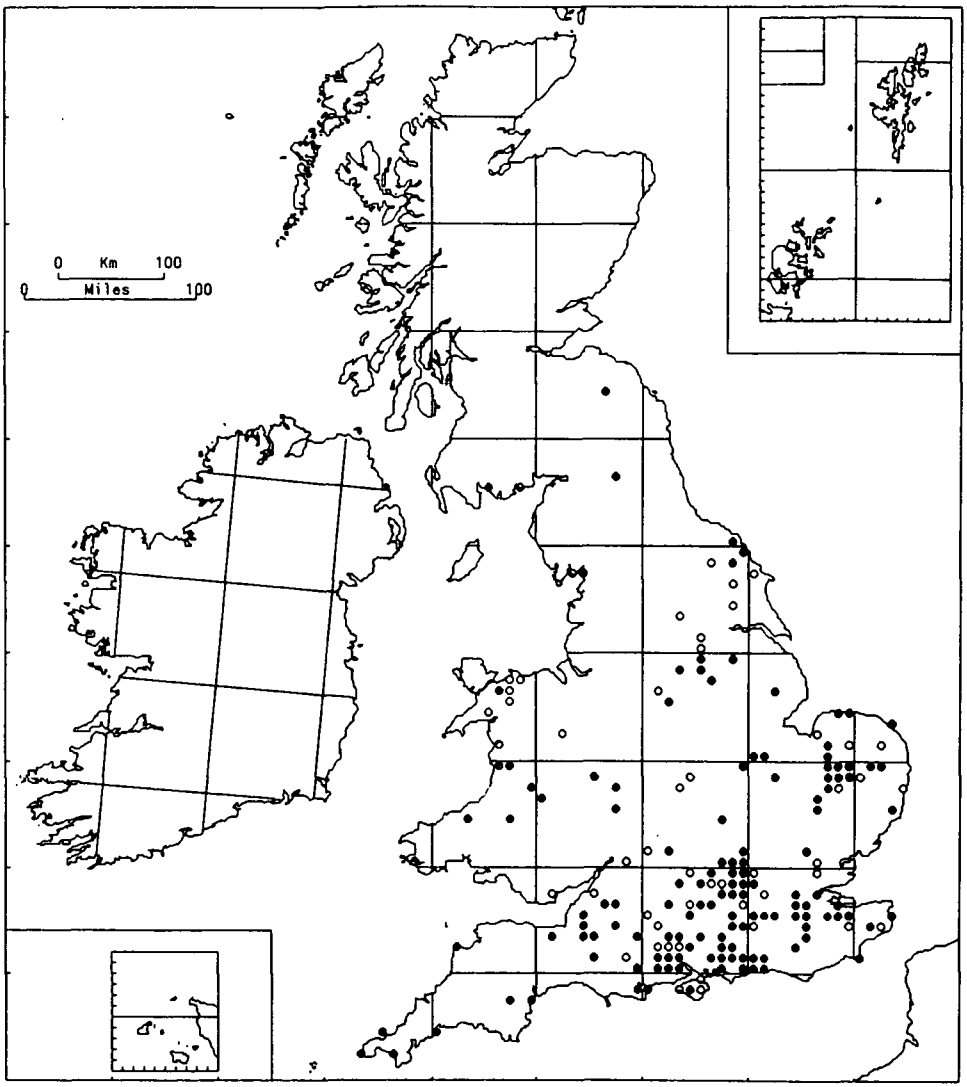
(Text on page 39)



Machimus atricapillus

Map 49

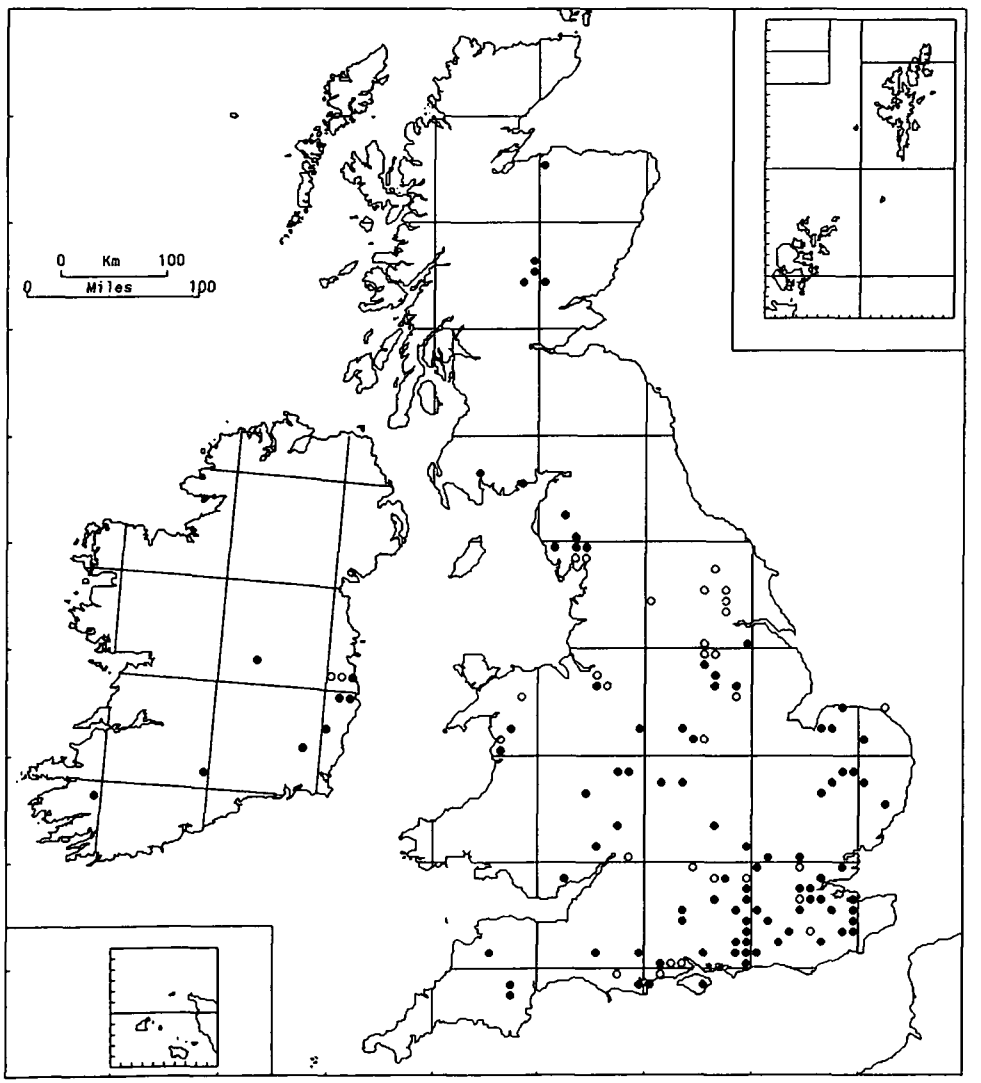
(Text on page 40)



Neoitamus cyanurus

Map 50

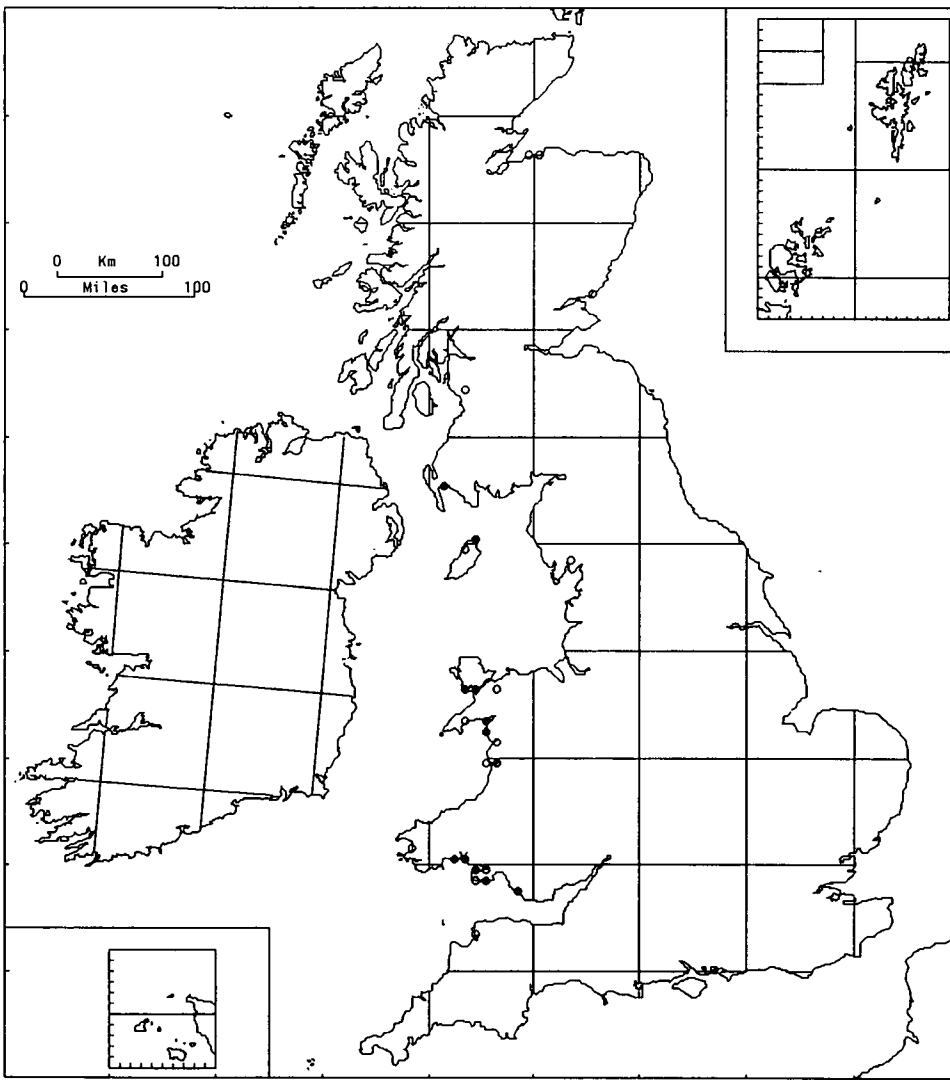
(Text on page 40)



Pamponerus germanicus

Map 51

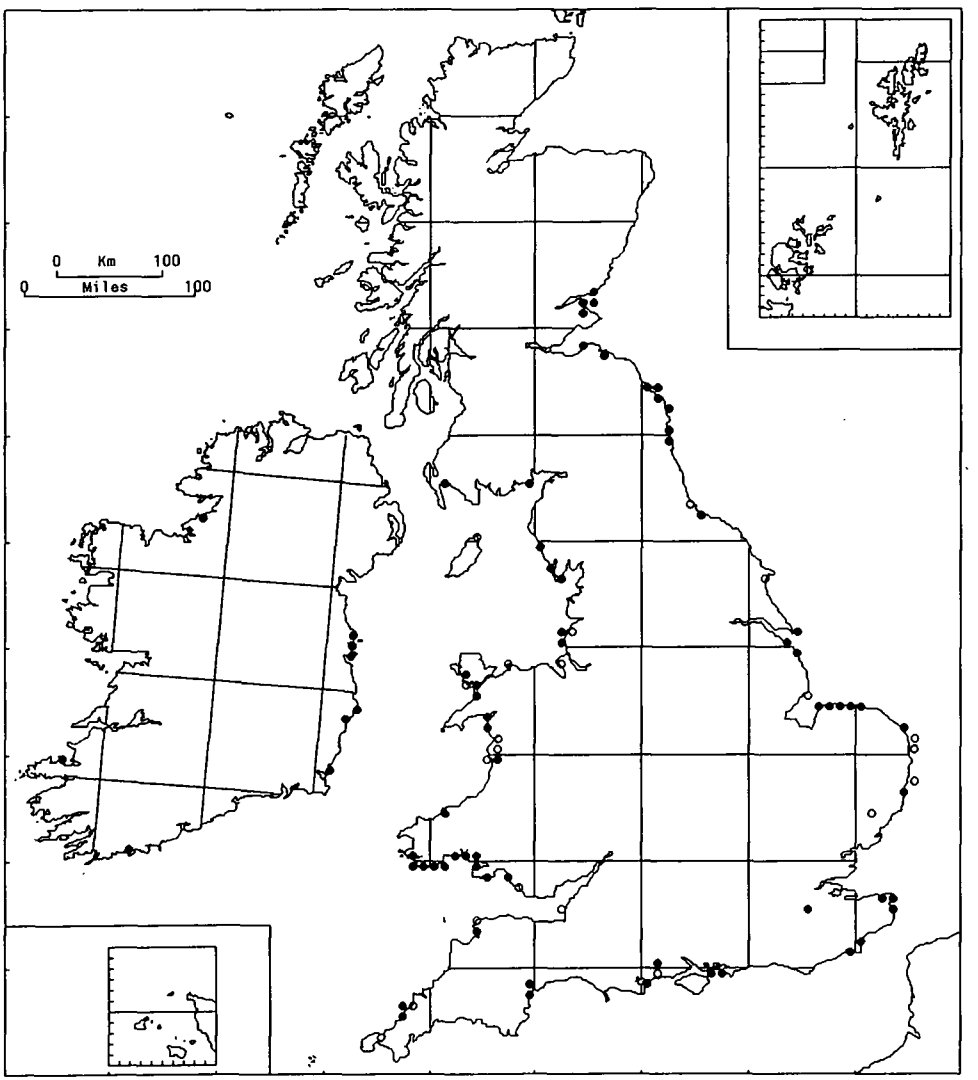
(Text on page 40)



Philonicus albiceps

Map 52

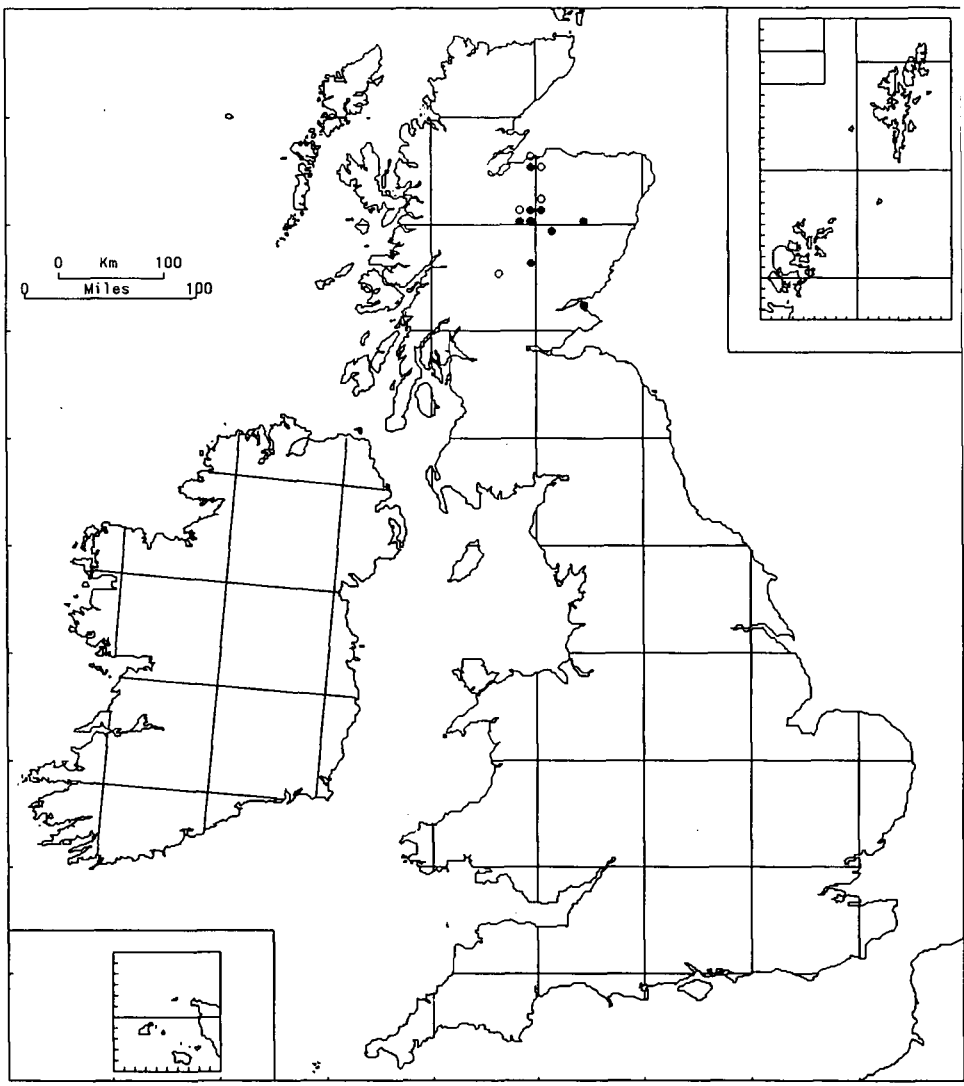
(Text on page 41)



Rhadiurgus variabilis

Map 53

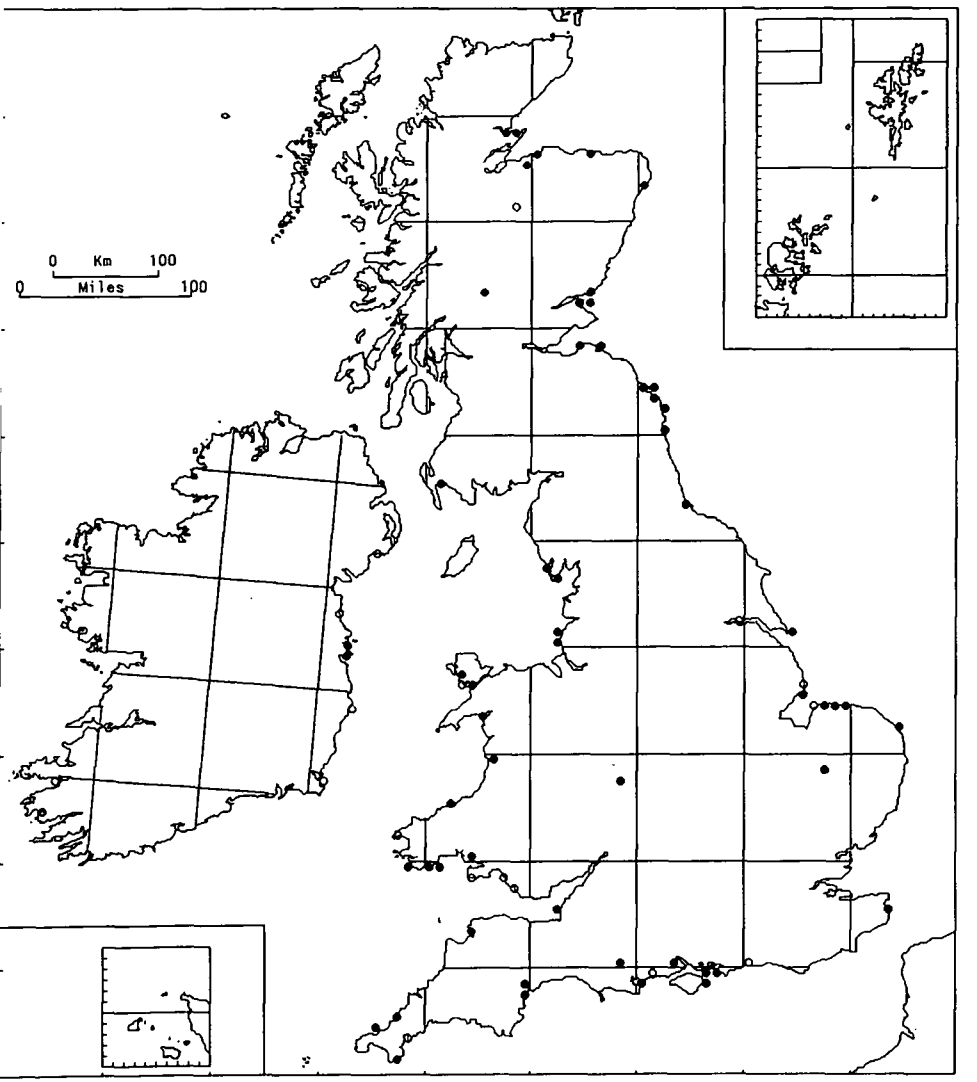
(Text on page 41)



Thereva annulata

Map 54

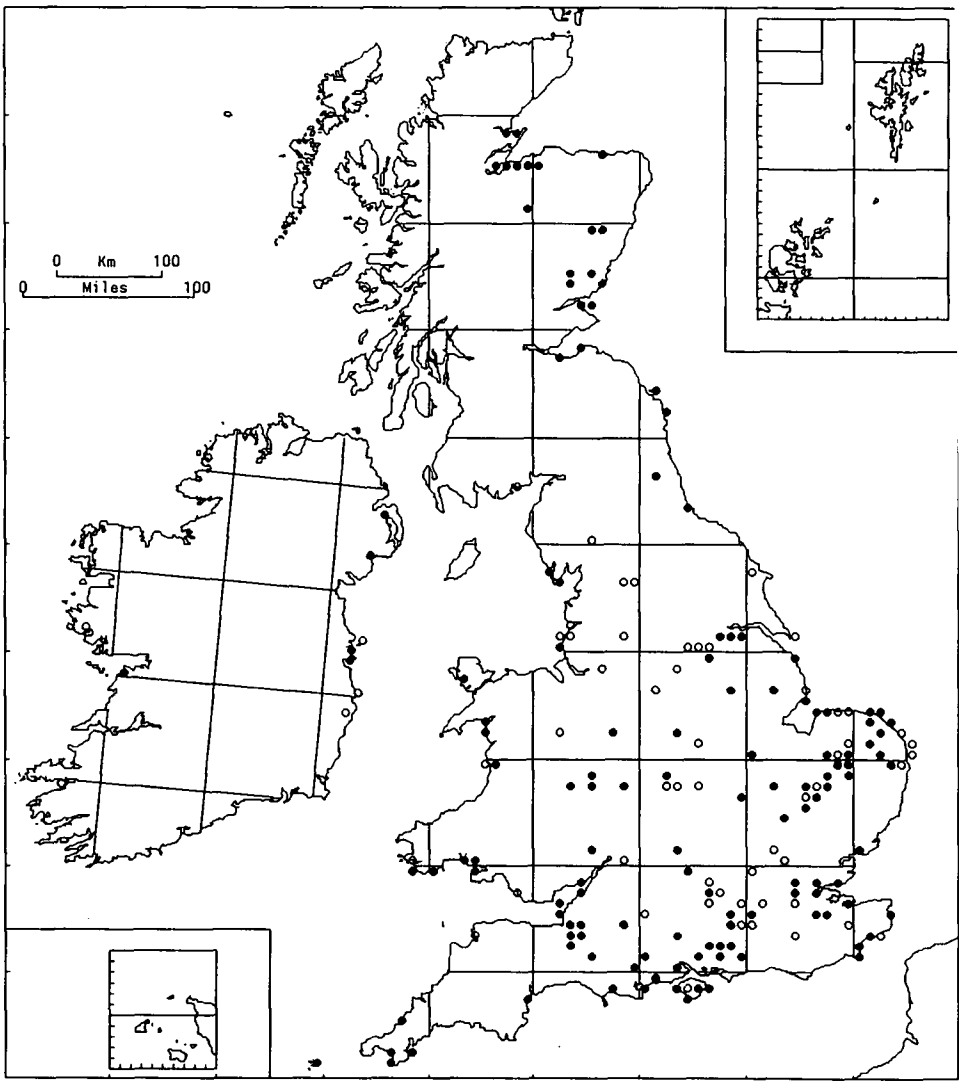
(Text on page 42)



Thereva nobilitata

Map 55

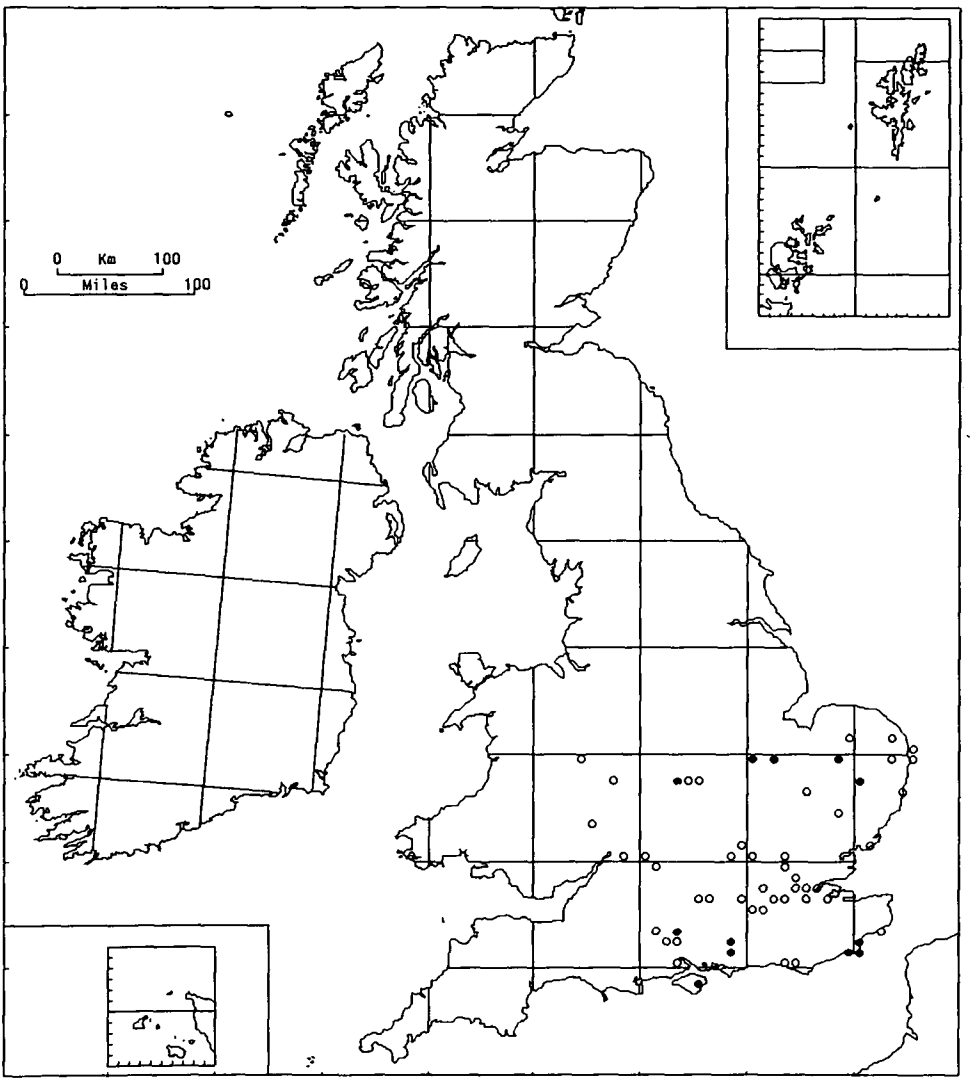
(Text on page 43)



Thereva plebeja

Map 56

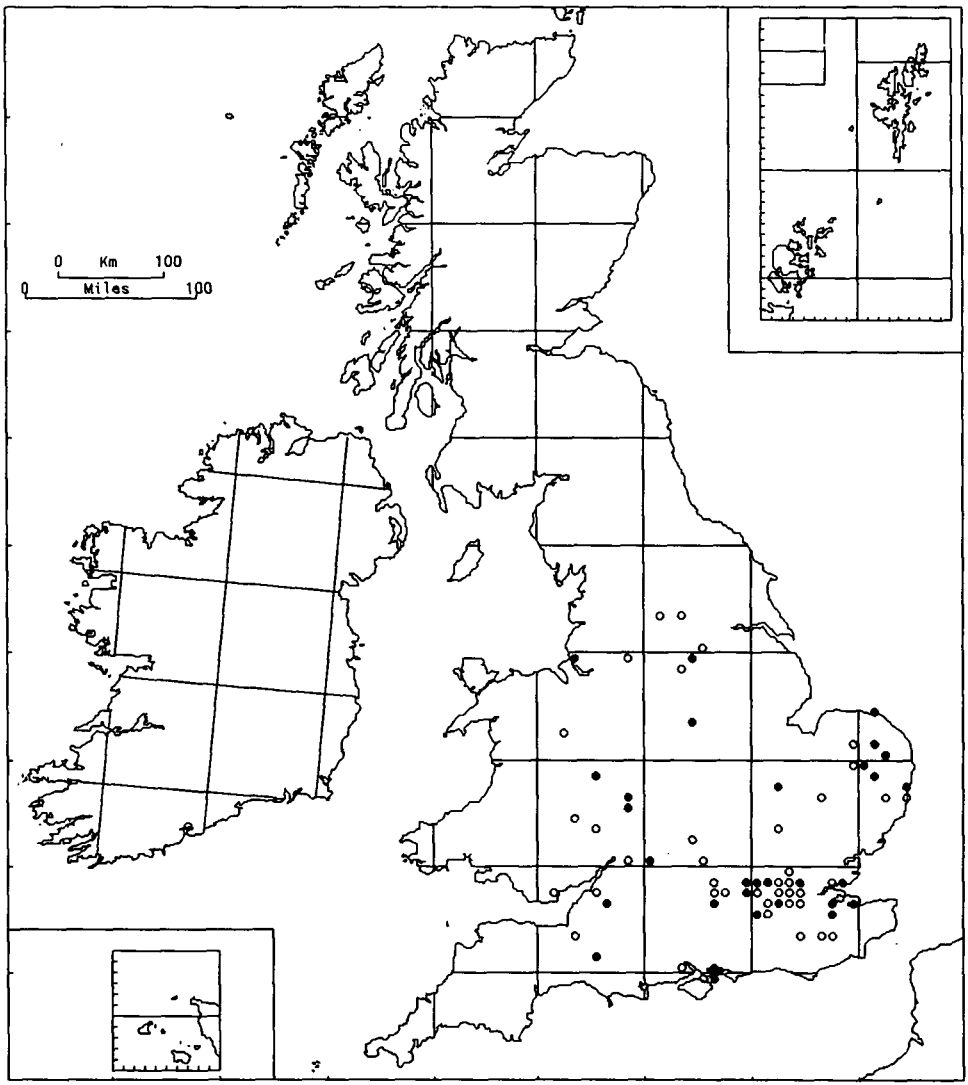
(Text on page 43)



Scenopinus fenestralis

Map 57

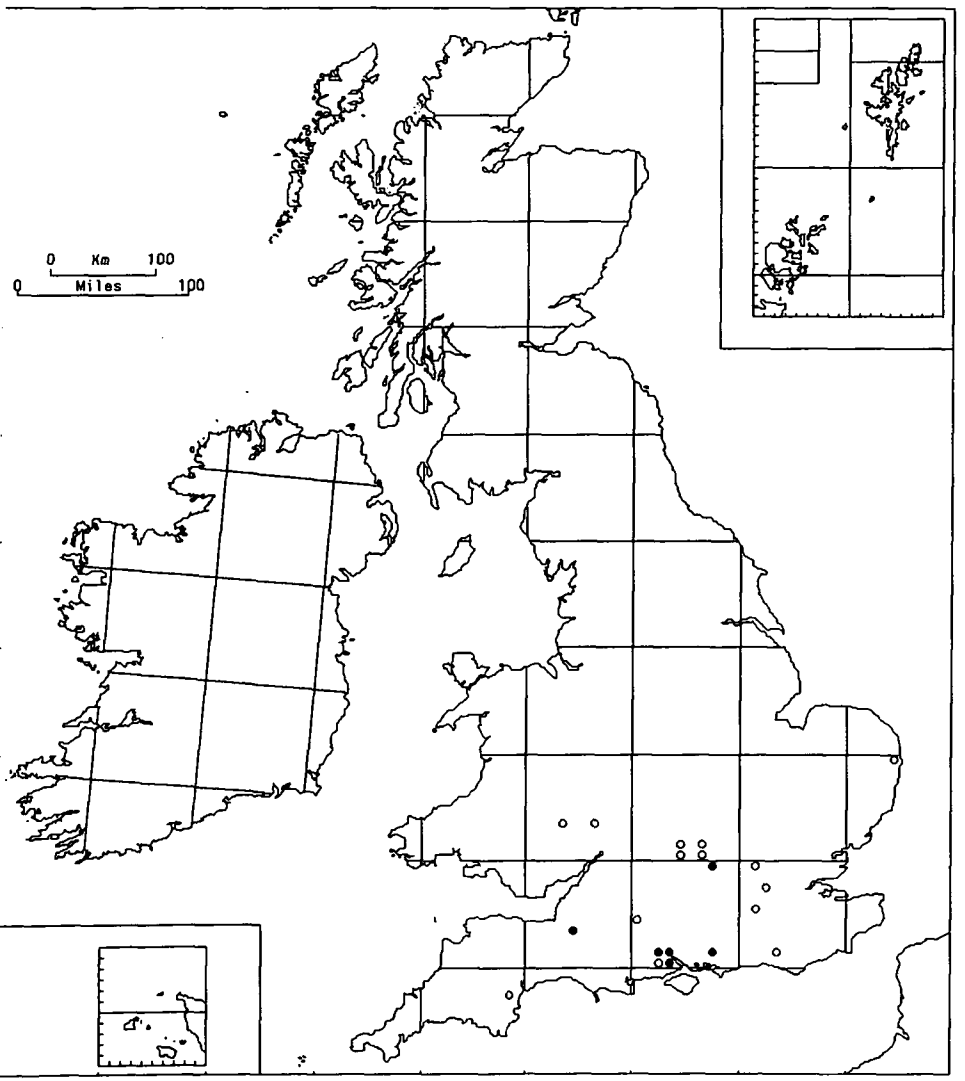
(Text on page 44)



Ogcodes gibbosus

Map 58

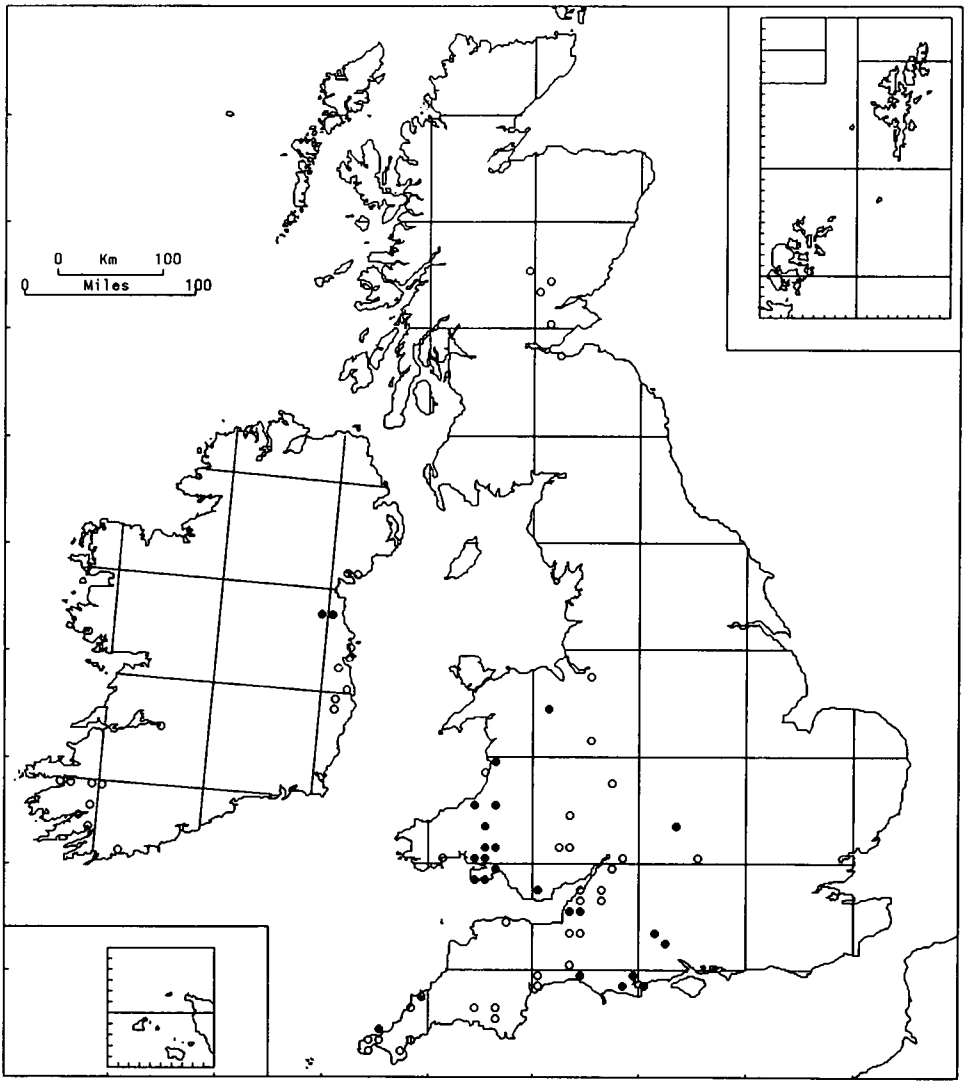
(Text on page 45)



Bombylius canescens

Map 59

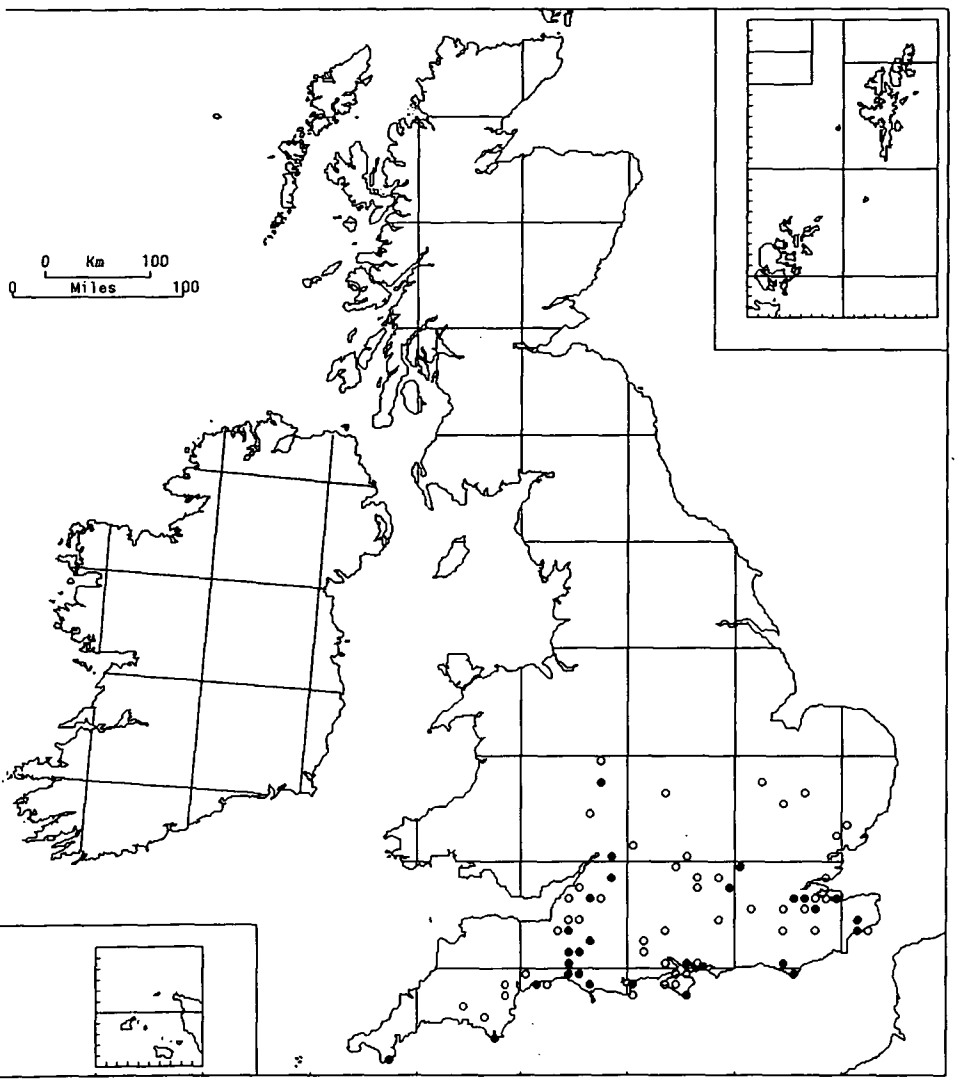
(Text on page 45)



Bombylius discolor

Map 60

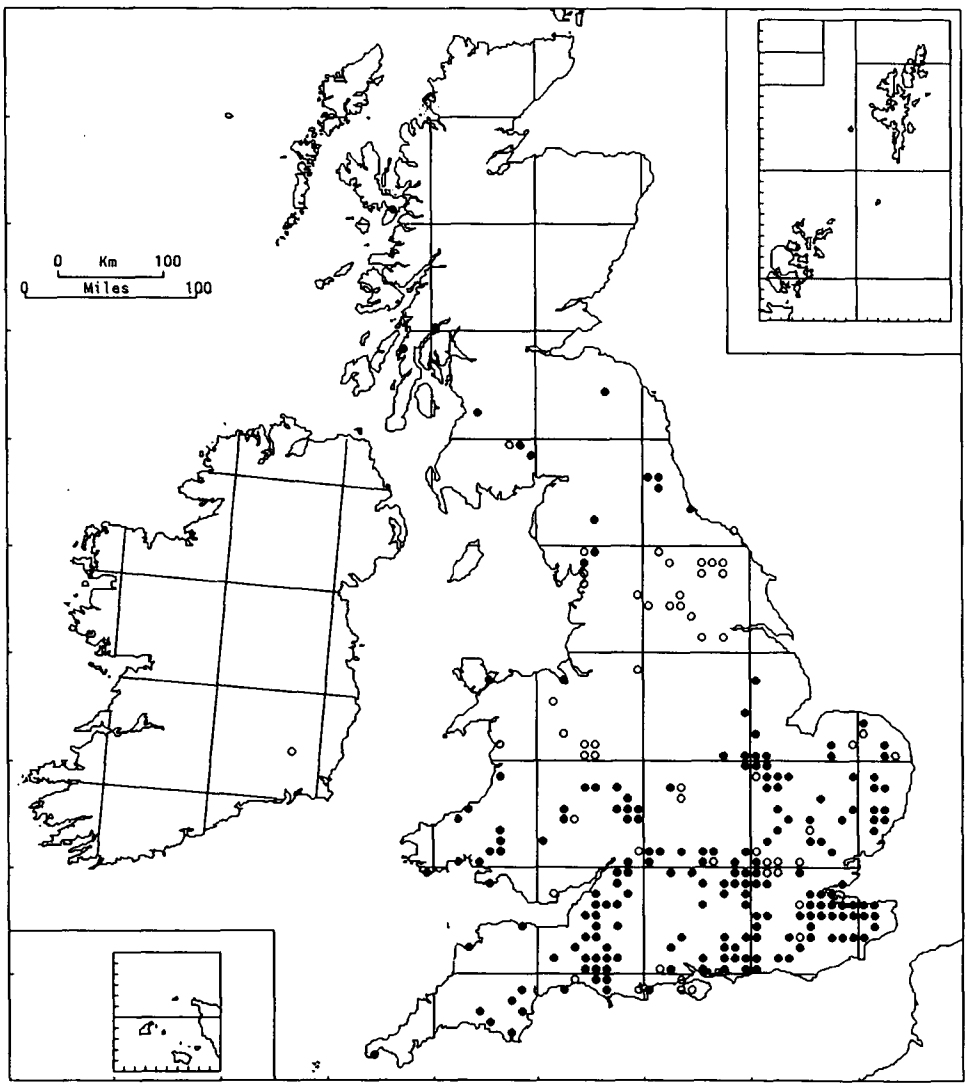
(Text on page 46)



Bombylius major

Map 61

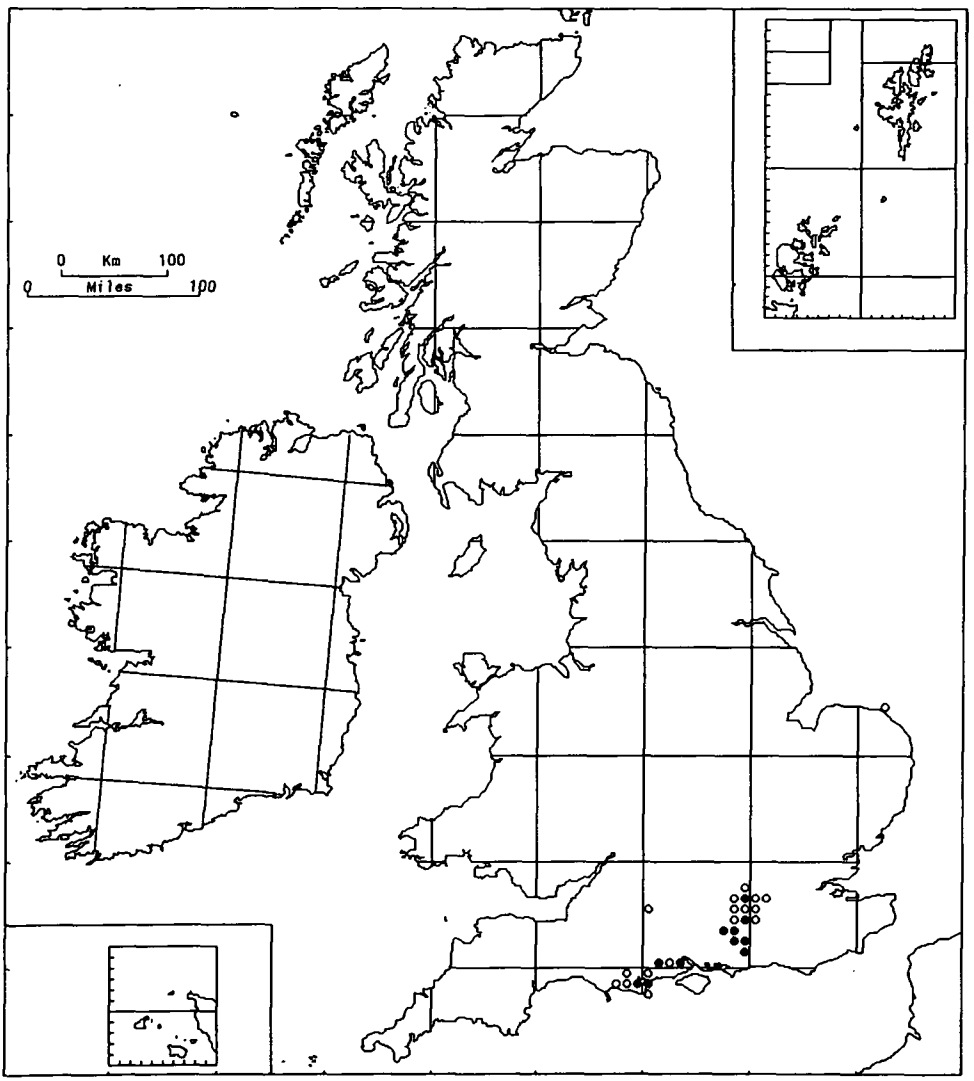
(Text on page 46)



Thyridanthrax fenestratus

Map 62

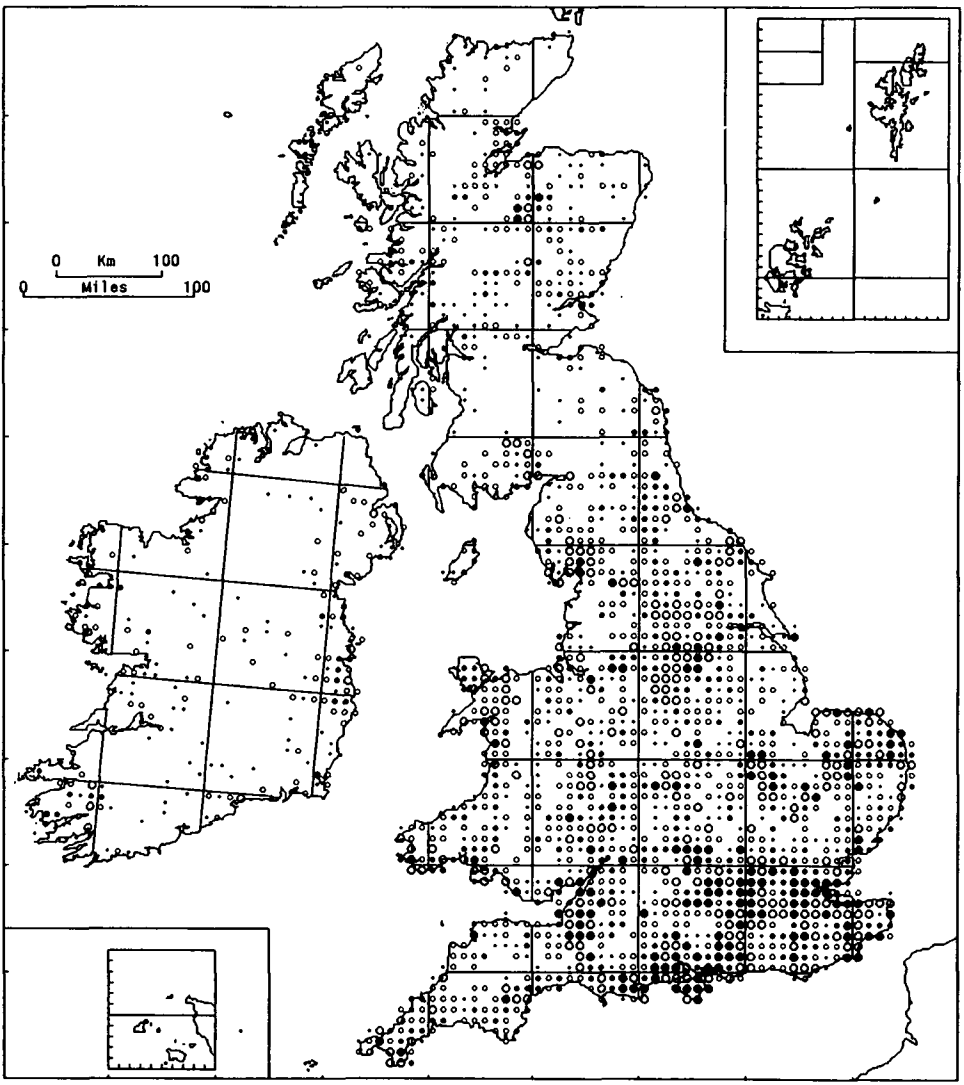
(Text on page 46)



LARGER BRACHYCERA

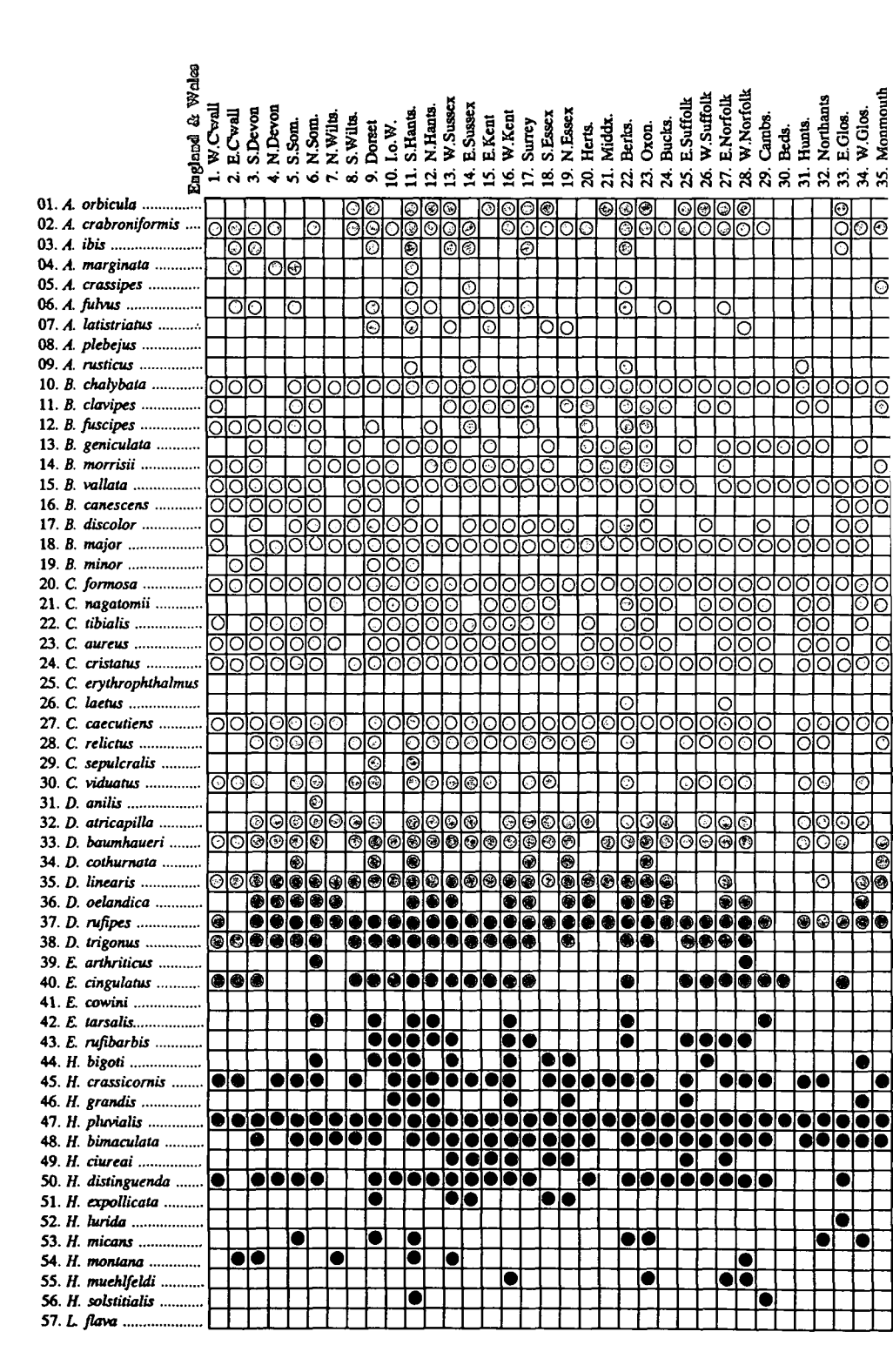
Map 63

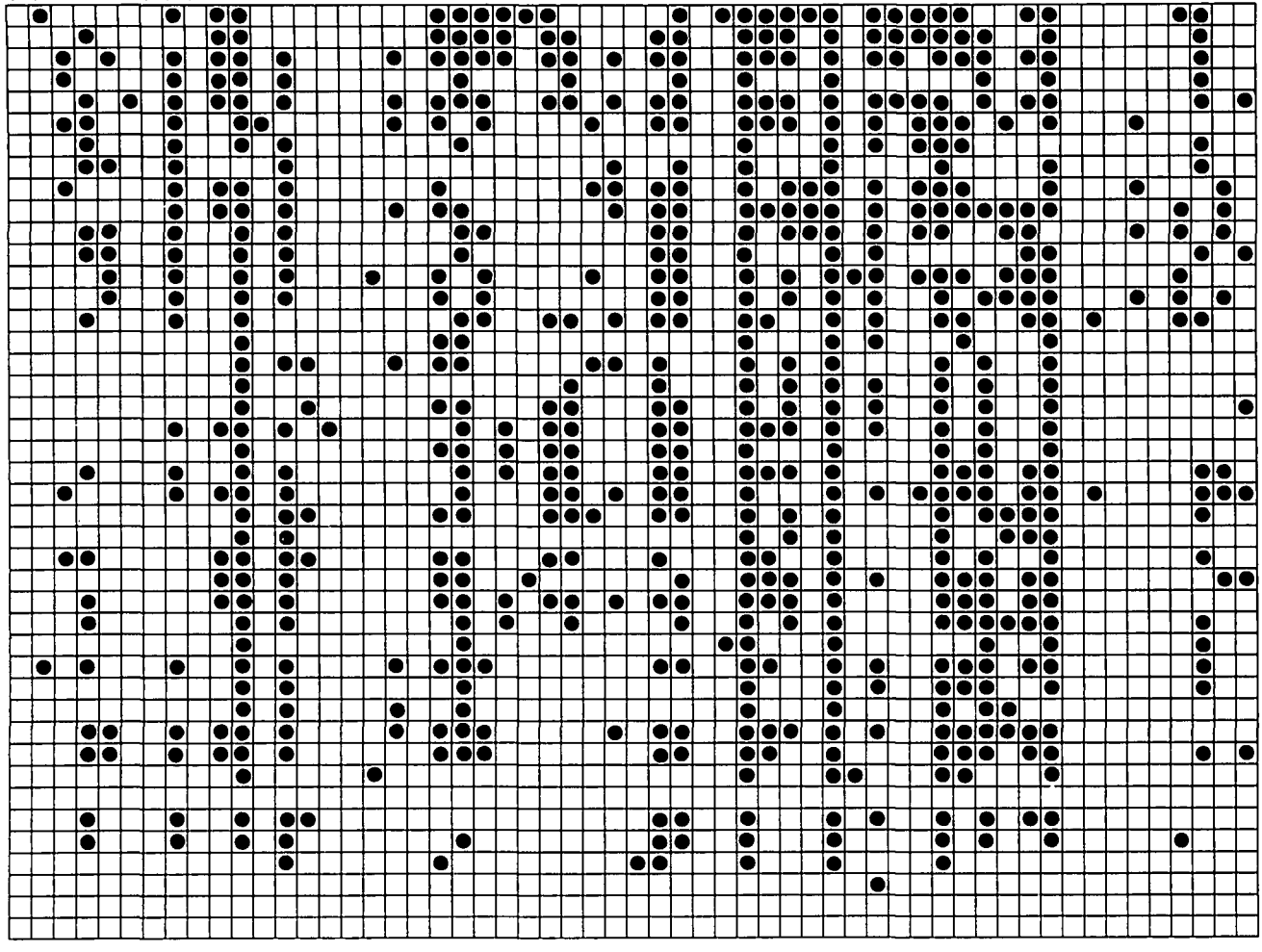
Number of species per 10 km square



VICE-COUNTY OCCURRENCES OF SPECIES

The following tables show the recorded occurrences of species in the Watson/Praeger biological vice-counties of Britain and Ireland and in the Channel Islands. Occurrences have not been differentiated by date and therefore some species may appear to be more widespread than is resently the case. However, important changes in the ranges of species are noted in the preceding species accounts and will be apparent on relevant maps (eg *Thereva plebeja*, p43 and map 56).


England & Wales
1. W.C'wall
2. E.C'wall
3. S.Devon
4. N.Devon
5. S.Som.
6. N.Som.
7. N.Wilts.
8. S.Wilts.
9. Dorset
10. I.o.W.
11. S.Hants.
12. N.Hants.
13. W.Sussex
14. E.Sussex
15. E.Kent
16. W.Kent
17. Surrey
18. S.Essex
19. N.Essex
20. Herts.
21. Middx.
22. Berks.
23. Oxon.
24. Bucks.
25. E.Suffolk
26. W.Suffolk
27. E.Norfolk
28. W.Norfolk
29. Cambs.
30. Beds.
31. Hunts.
32. Northants
33. E.Glos.
34. W.Glos.
35. Monmouth
01. A. orbicula
02. A. crabroniformis
03. A. ibis
04. A. marginata
05. A. crassipes
06. A. fulvus
07. A. latistriatus
08. A. plebejus
09. A. rusticus
10. B. chalybata
11. B. clavipes
12. B. fuscipes
13. B. geniculata
14. B. morrisii
15. B. vallata
16. B. canescens
17. B. discolor
18. B. major
19. B. minor
20. C. formosa
21. C. nagatomii
22. C. tibialis
23. C. aureus
24. C. cristatus
25. C. erythrophthalmus
26. C. laetus
27. C. caecutiens
28. C. relictus
29. C. sepulcralis
30. C. viduatus
31. D. anilis
32. D. atricapilla
33. D. baumhaueri
34. D. cothurnata
35. D. linearis
36. D. oelandica
37. D. rufipes
38. D. trigonus
39. E. arthriticus
40. E. cingulatus
41. E. cowini
42. E. tarsalis
43. E. rufibarbis
44. H. bigoti
45. H. crassicornis
46. H. grandis
47. H. pluvialis
48. H. bimaculata
49. H. ciureai
50. H. distinguenda
51. H. expollicata
52. H. lurida
53. H. micans
54. H. montana
55. H. muehlfeldi
56. H. solstitialis
57. L. flava



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66. Durham
67. S.Northd.
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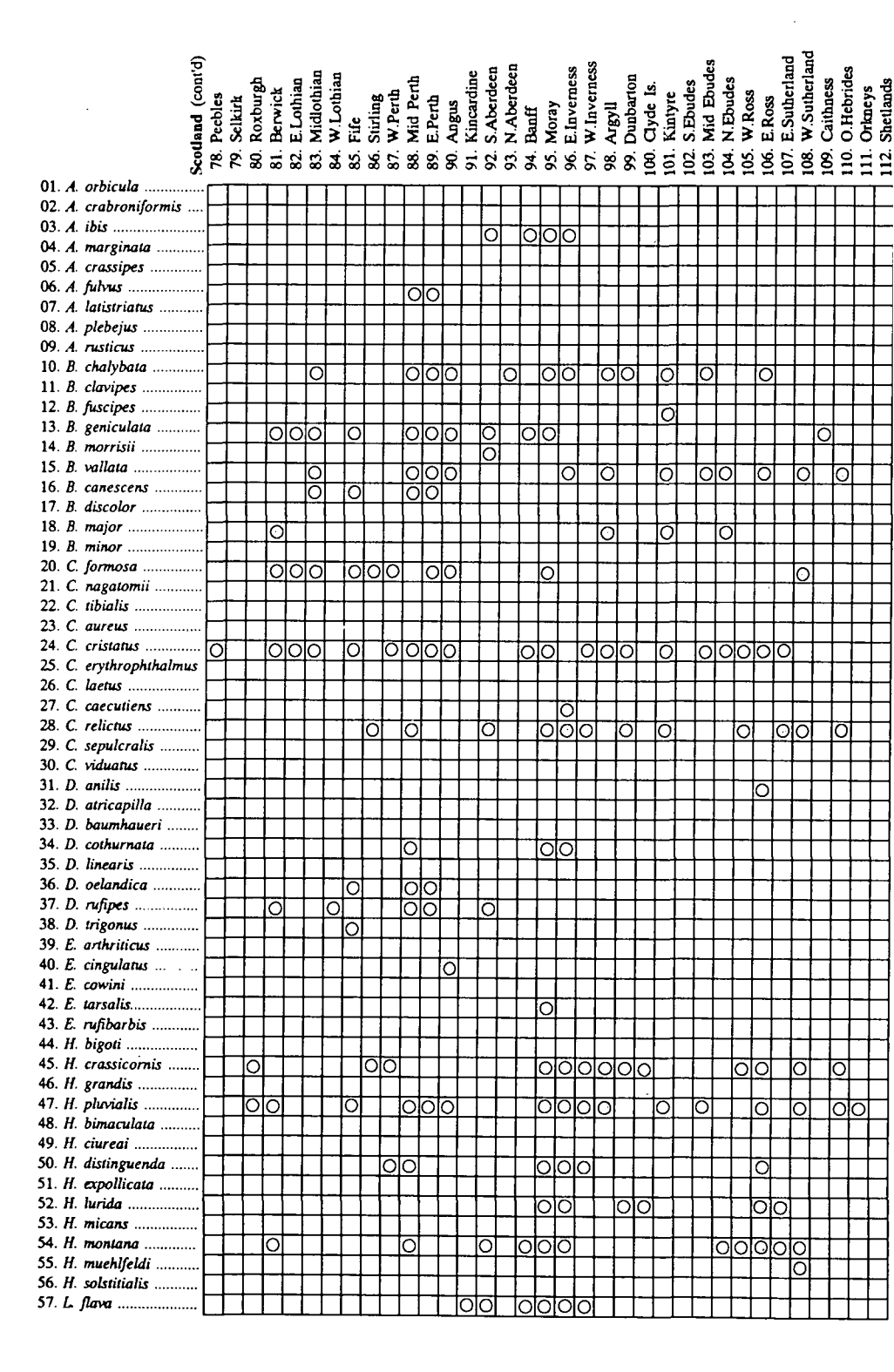
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108. W.Sutherland
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02. A. crabroniformis
03. A. ibis
04. A. marginata
05. A. crassipes
06. A. fulvus
07. A. latistriatus
08. A. plebejus
09. A. rusticus
10. B. chalybata
11. B. clavipes
12. B. fuscipes
13. B. geniculata
14. B. morrisii
15. B. vallata
16. B. canescens
17. B. discolor
18. B. major
19. B. minor
20. C. formosa
21. C. nagatomii
22. C. tibialis
23. C. aureus
24. C. cristatus
25. C. erythrophthalmus
26. C. laetus
27. C. caecutiens
28. C. relictus
29. C. sepulcralis
30. C. viduatus
31. D. anilis
32. D. atricapilla
33. D. baumhaueri
34. D. cothurnata
35. D. linearis
36. D. oelandica
37. D. rufipes
38. D. trigonus
39. E. arthriticus
40. E. cingulatus
41. E. cowini
42. E. tarsalis
43. E. rufibarbis
44. H. bigoti
45. H. crassicornis
46. H. grandis
47. H. pluvialis
48. H. bimaculata
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50. H. distinguenda
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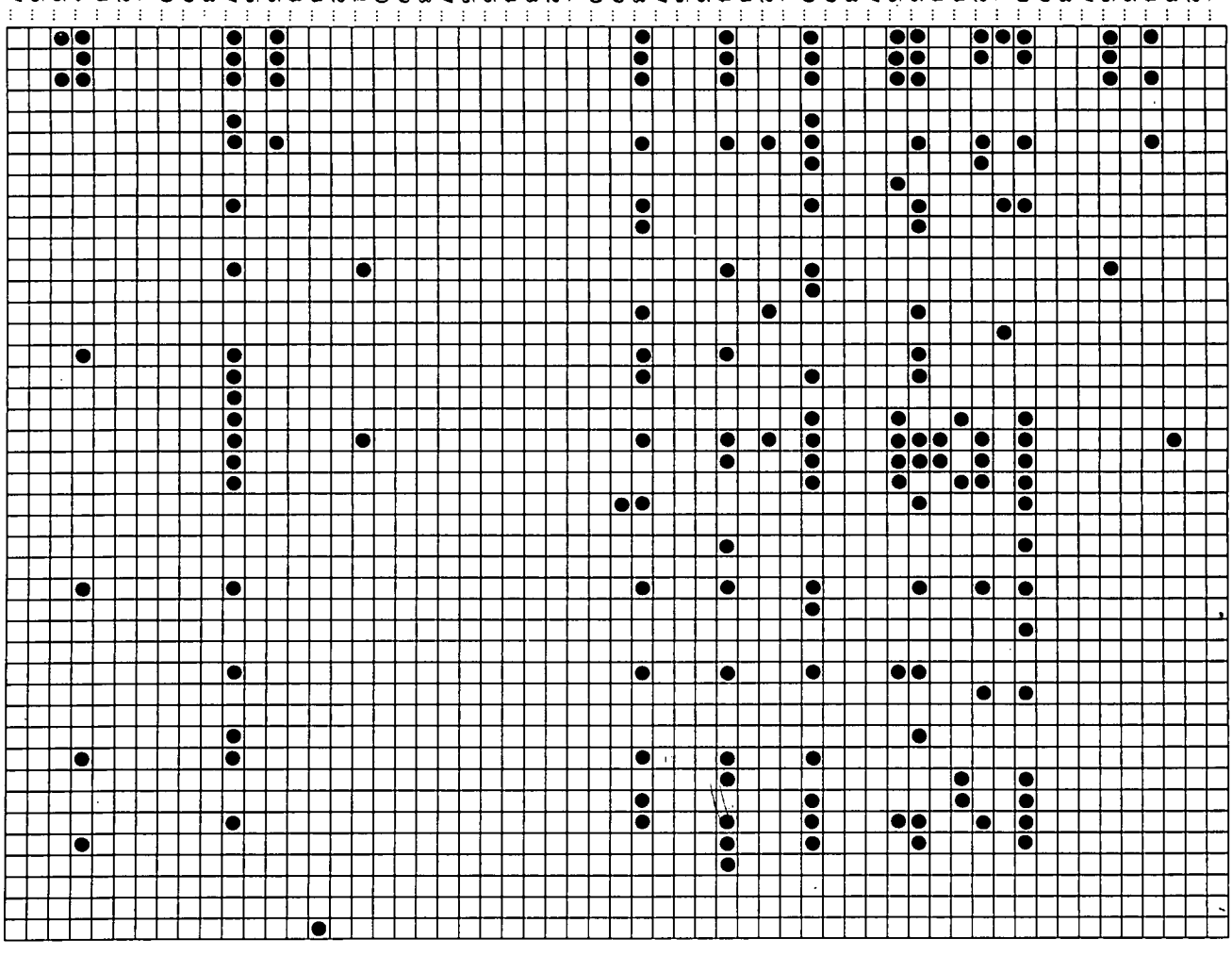
57. L. flava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6. N.Som.
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8. S.Wilts.
9. Dorset
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62. L. cylindrica
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67. M. flavicornis
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73. N. cothurnatus
74. N. cyanurus
75. N. meromelaena
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77. O. argentata
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81. O. viridula
82. O. gibbosus
83. O. pallipes
84. O. analis
85. O. dives
86. O. fallenii
87. O. morrisii
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89. O. pardalina
90. O. pygmaea
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92. O. terminata
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108. R. strigosus
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114. S. fenestralis

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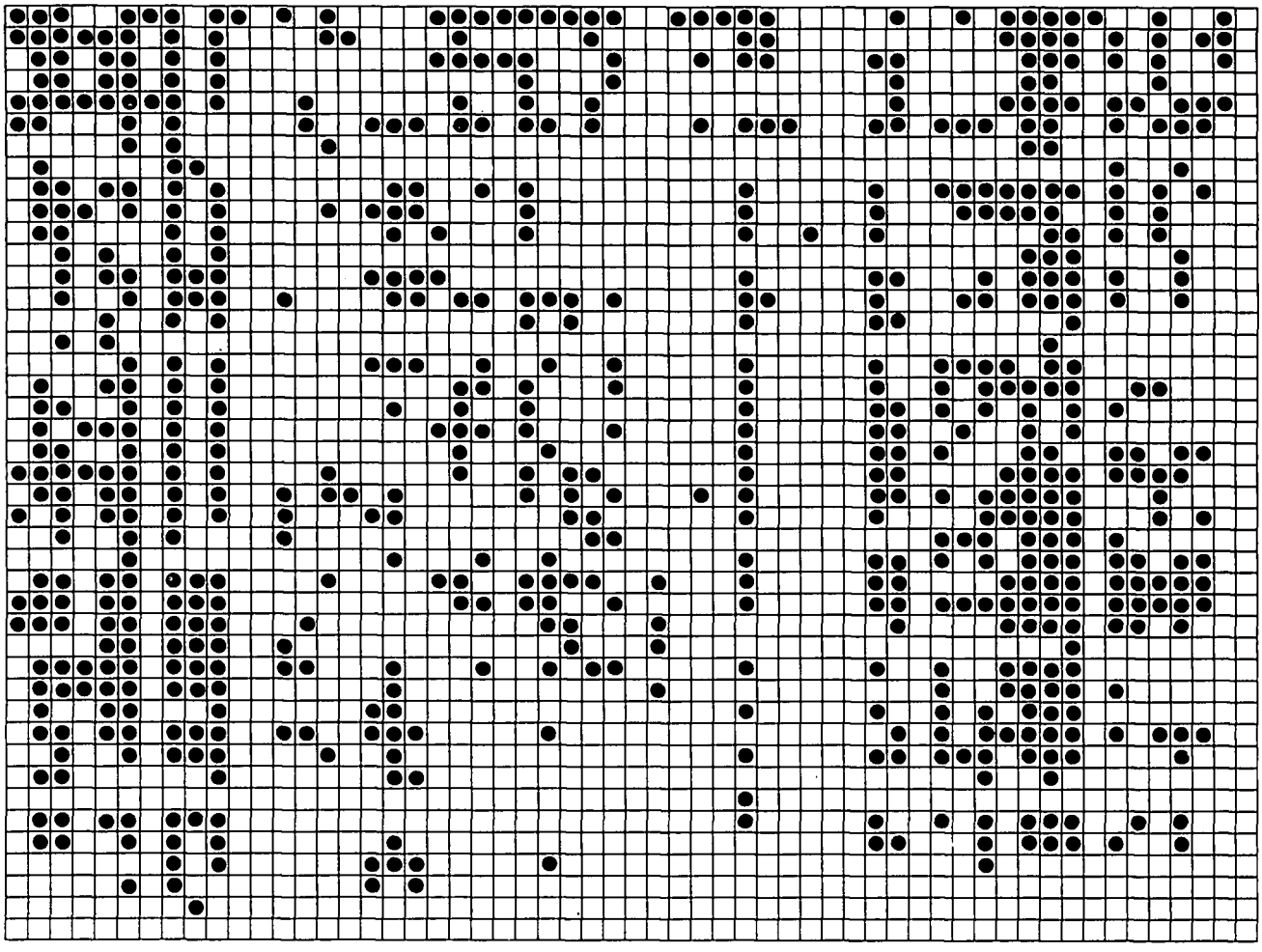

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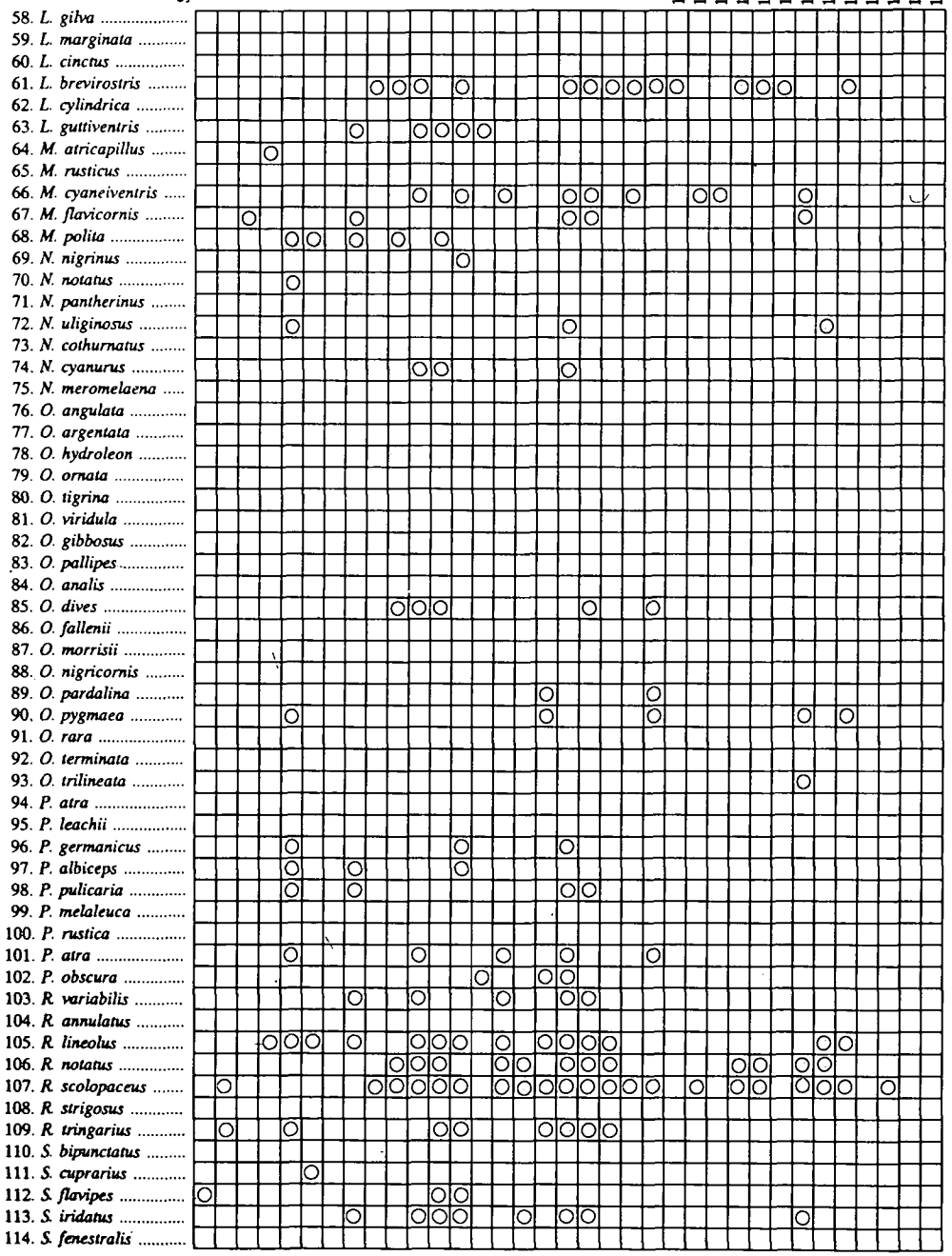
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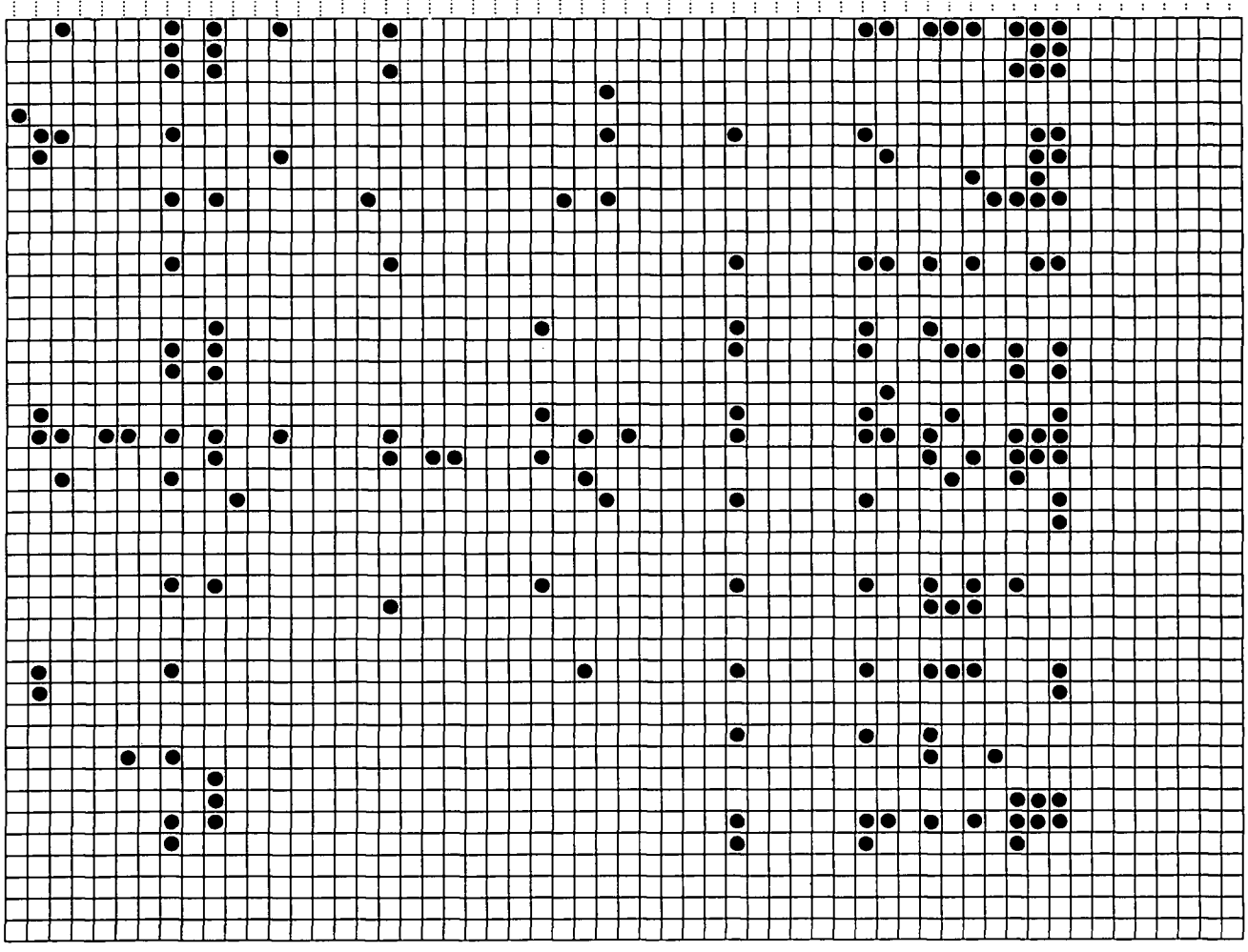
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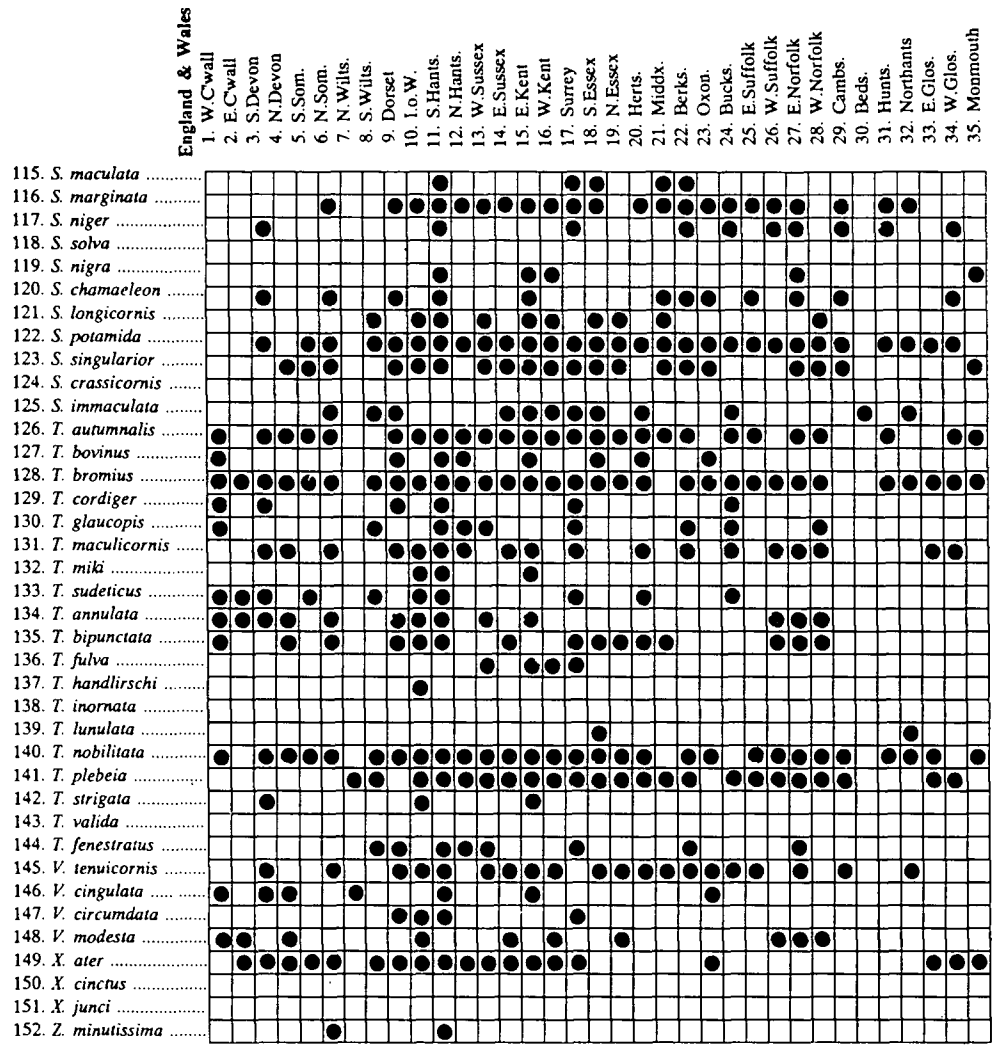
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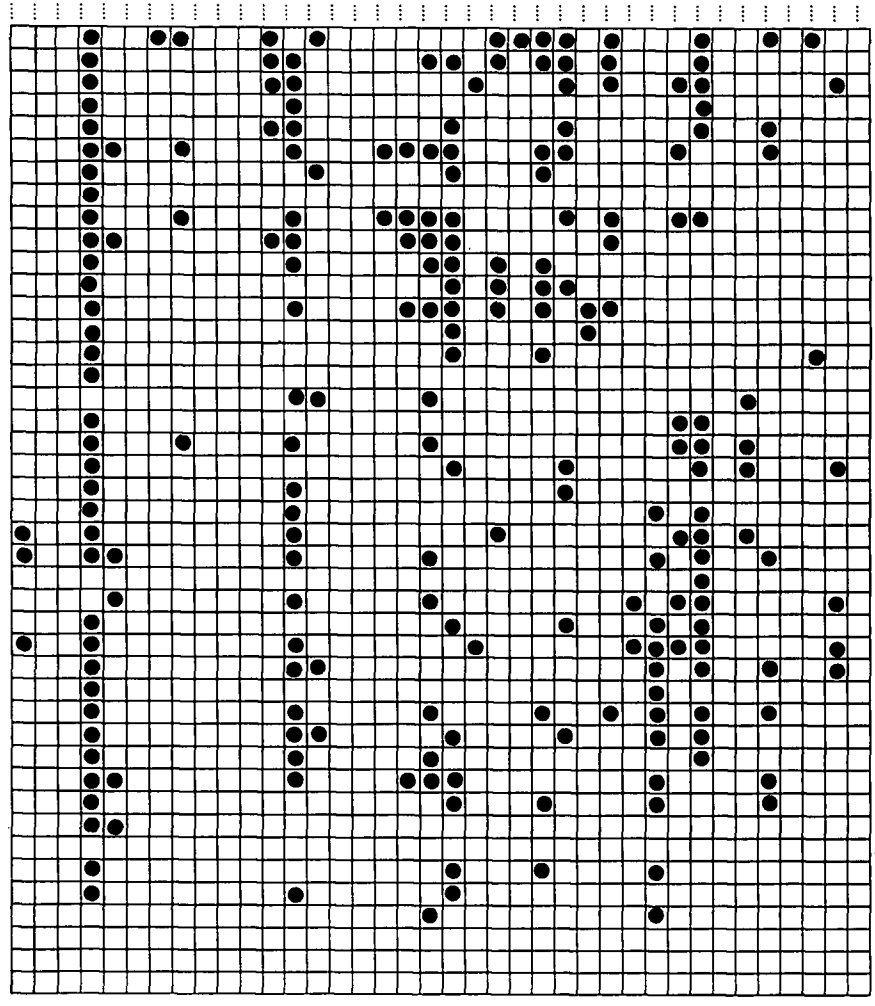
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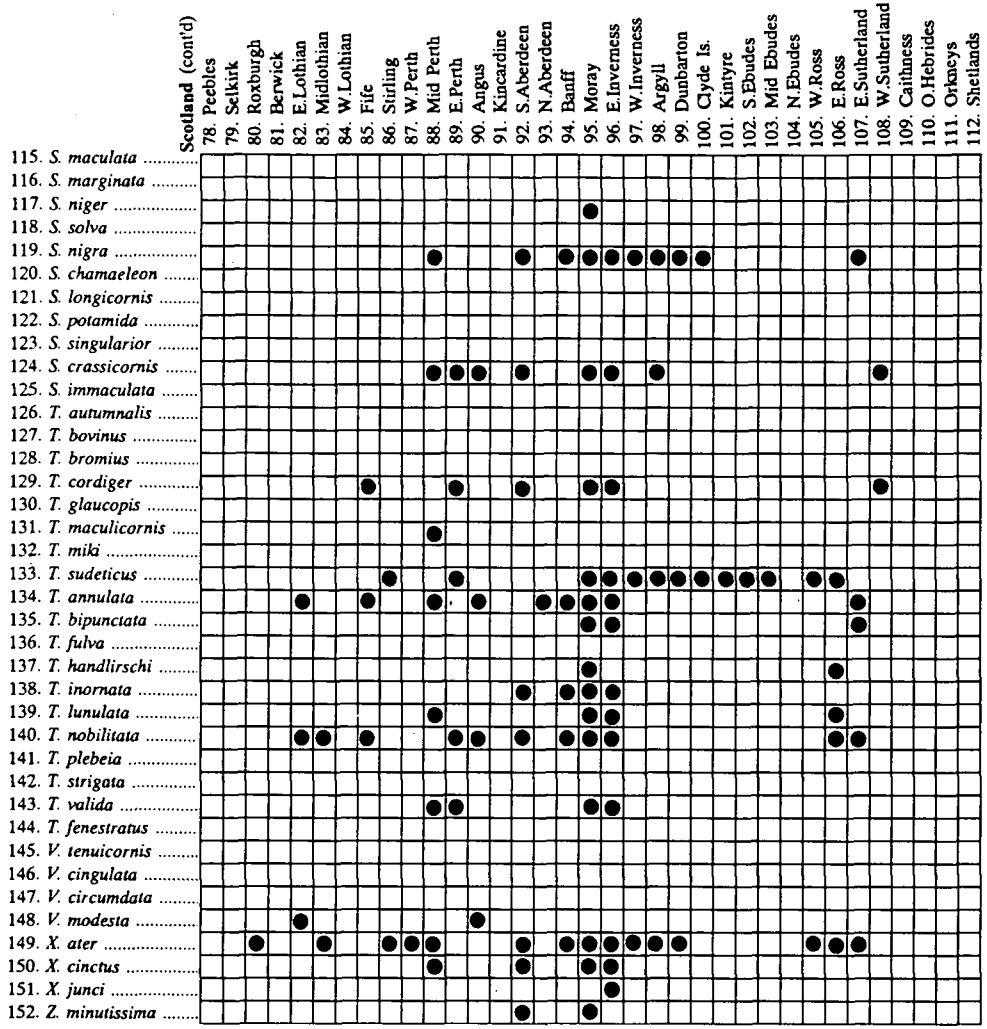
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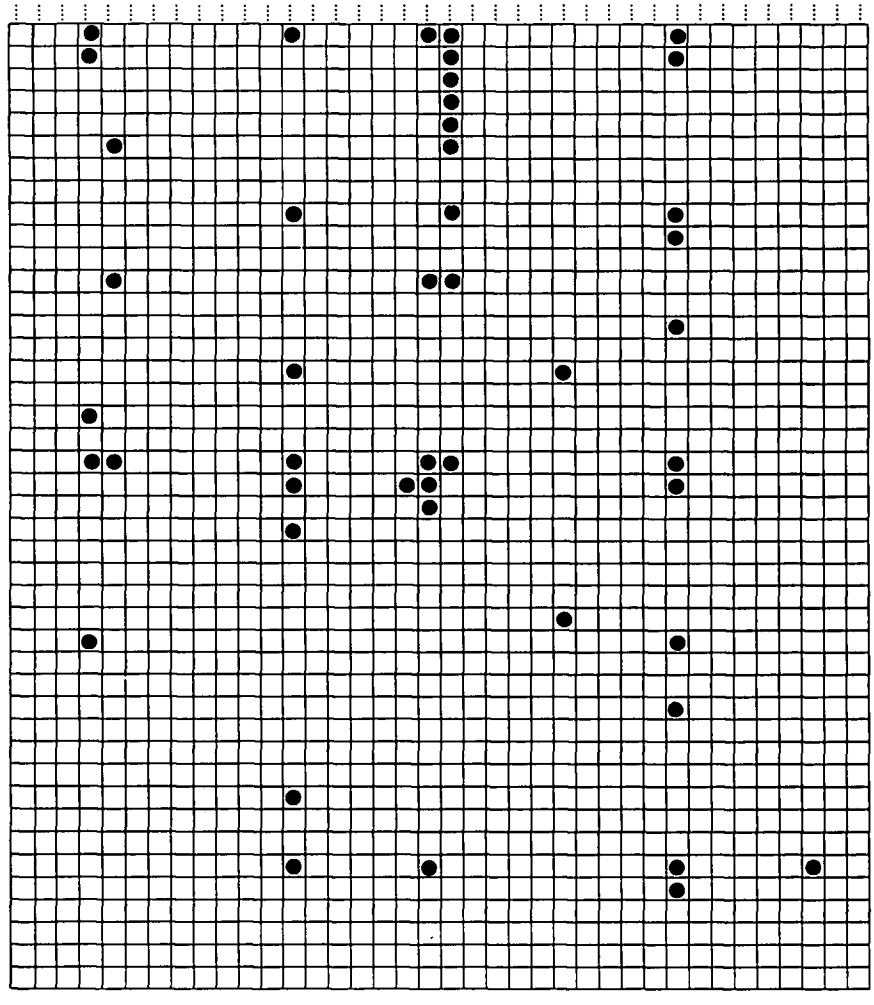
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Thereva annulata	42	105	54
bipunctata	42	-	-
fulva	42	-	-
handlirschi	42	-	-
inornata	43	-	-
lunulata	43	-	-
nobilitata	43	106	55
plebeja	43	107	56
strigata	43	-	-
valida	44	-	-
Thyridanthrax fenestratus	46	113	62
Vanoyia tenuicornis	23	70	19
Villa cingulata	47	-	-
circumdata	47	-	-
modesta	47	-	-
Xylophagus ater	24	72	21
cinctus	25	-	-
junci	25	-	-
Zabrachia minutissima	23	-	-


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